МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ УНІВЕРСИТЕТ МІСЬКОГО ГОСПОДАРСТВА імені О. М. БЕКЕТОВА

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ENGLISH FOR ELECTRICAL ENGINEERS

АНГЛІЙСЬКА МОВА
ДЛЯ СТУДЕНТІВ ЕЛЕКТРОТЕХНІЧНИХ СПЕЦІАЛЬНОСТЕЙ

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Бучковська С. А.

Б94 English for electrical engineers = Англійська мова для студентів електротехнічних спеціальностей : навч. посіб. / С. А. Бучковська, Г. Б. Сергєєва, О. Л. Ільєнко; Харків. нац. ун-т міськ. госп-ва ім. О. М. Бекетова. – Харків: ХНУМГ, 2015. – 246 с.

Метою створення посібника є формування навичок професійного спілкування студентів електротехнічних спеціальностей вищих навчальних закладів. Зміст завдань, в яких поєднано сучасні та традиційні методики, визначено згідно з навчальними потребами спеціалістів даної галузі. Розділи посібника побудовано таким чином, щоб студент мав змогу зосередитися на таких видах діяльності як читання, виконання лексико-граматичних та письмових вправ, а також творчих завдань, які спрямовані на розвиток усного мовлення у повсякденному та професійному контексті. Велика кількість творчих завдань дозволяє розвивати аналітичне, критичне та творче мислення студентів. сприяє формуванню необхідних компетенцій та зміцненню конкурентоспроможності випускників на сучасному ринку праці. В останній частині посібника вміщено довідковий матеріал, який студенти мають змогу використовувати для самостійного виконання завдань.

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INTRODUCTION

The textbook is designed for the students taking a Bachelor course in Electrical Engineering and deals with the English language from the students' potential occupational perspective.

The textbook consists of 17 units each of which has its own thematic focus that reflects the students' needs and interests in the first year of studies at a higher education institution or is relevant to future employees who will be engaged in different positions and roles in the Energy Industry. Each unit includes five parts: LEAD-IN, READING, VOCABULARY, LANGUAGE REVIEW and SKILLS that aim at the development of the main language skills necessary to become efficient in the professional English language environment.

Each unit begins with the LEAD-IN section to introduce the topic, to engage the students' interest and encourage them to share their knowledge and opinion linked to the subject under consideration.

The READING part focuses on training the English language reading skills within the topics supposed to be of value in students' education and future professional field. The texts to read give opportunities for further discussion.

In the VOCABULARY section the system of diverse exercises and activities provide the intensive practice of the topic-related language enlarging the active and professional vocabulary.

LANGUAGE REVIEW systematically revises and consolidates the main grammar issues through a variety of exercises providing the students with the flexibility in expressing their views orally and in writing.

SKILLS activities that are at the end of each unit revise language taught in the unit, develop the students' critical thinking, problem solving abilities and encourage them to bring their own ideas and imagination to the related topic.

Brief GRAMMAR REFERENCES are provided at the back of the textbook and focus on the key grammatical problems the intermediate learners can face. It is organaised according to the grammar aspects presented in the LANGUAGE REVIEW part of each unit and provides the explanation of the grammar points followed by the examples given mostly in everyday conversational or business English. The textbook is also supplied with the appendix on the irregular verbs.

English for Electrical Engineers is for learners of English who need to use the language effectively in the field of the energy business and the associated fields. It supposes to equip learners with the necessary linguistic skills to function successfully in the work environment.

UNIT 1

1 LEAD-IN

Introduce yourself to your partner and interview him or her putting the following questions:

1 How long have you been learning the English language?

2 What is learning English for you (a necessity/a hobby/ an effort/ an opportunity/ a problem/ a pleasure/ other ideas)?

3 What do you think you will need English for in your future career?

- getting interesting and competitive job
- reading professional literature
- socializing with your business contacts and colleagues from other countries
- travelling abroad on business
- doing business on the phone
- writing e-mails, letters and faxes
- taking part in conferences and meetings
- making presentations
- other ideas

4 What language skills do you find necessary for you to improve?

5 Is the knowledge of technical English important for you?

6 How can you gain greater knowledge of technical English?

2 READING

EVERYDAY ENGLISH AND TECHNICAL ENGLISH

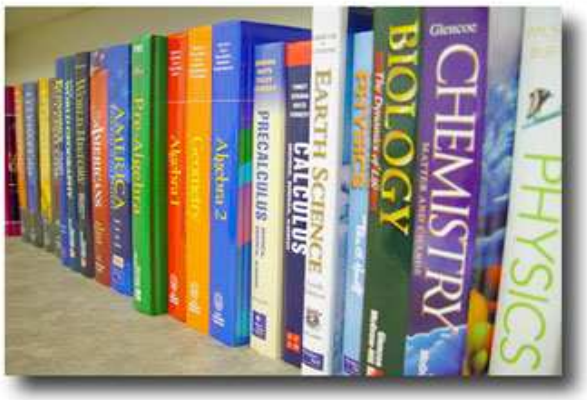
(1) At present, the contacts between people of different countries are increasing. This enhances the importance of the study of foreign languages. The

matter is that the total number of languages in the world is very large. According to different reference books it varies from five to eight thousands. The numerical distribution of people speaking different languages is extremely uneven. There are not many languages in the world spoken by more than 50 million people. On the other hand, there are languages spoken by only several thousands of people. Everyone should understand that for the

linguist there are no big or small languages. For each person the language is not only a means of communication, but also an embodiment of national and cultural values. Nevertheless, when we have to decide which of the world's languages to study, we take into consideration the differences in the social and functional status of each language.

(2) When we consider English, we have to keep in mind that the English language is spoken by more native speakers than any other language. English is native or the first language for most population of Great Britain, USA, Canada, Australia, New Zealand. Besides, there are many areas,where English is not a native language, but a second language with the official status in education and administration, and for communication between speakers of other languages. English as a foreign language is the most widely spread of the world's languages. A quarter of the world currently speaks English. That is one and a half billion people, two-thirds of whom speak it asa foreign language. English is one of the five official languages of the United Nations Organization alongside French, Russian, Spanish and Chinese. It is the working language during the meetings of the General Assembly and Security Council of the UNO. English has rapidly become the first language of business, science and popular culture. Three-quarters of the world's mail is in English. So are four of five e-mails and most of what you find on the Internet.

(3) No wonder that so many people in various countries spare no efforts to acquire English for communication. In a recent survey, 69% of Europeans said they thought everyone should speak English. More than half of them already do. For most people it is not a question of choice but of necessity. Higher school students and postgraduates are trained to have a good knowledge of English, to read and use professional literature in their practical activity.



(4) Technical English is often believed to be more difficult to understand. There are a number of reasons for that. First of all it concerns its vocabulary. The scientific and technical progress has enriched the vocabulary with a great deal of new words, new meanings and new word-combinations. Scientists and technologists also use many ordinary, everyday words to denote new terminological meanings. Each

branch of science and technology has its own vocabulary (terminology). Many of them are formed from the words of Greek or Latin origin and are often international. Some technical words, borrowed from everyday English, sometimes cause much greater difficulty than terminology.

(5) As to grammatical patterns and models, they are the same as in everyday English. There is a difference in the frequency of occurring some grammatical forms. Scientific and technical writing is usually about things, matter, natural processes, and it is impersonal in style.

(6) Simple sentences are uncommon, for engineers seldom deal with isolated facts or events.The engineer has to show what the connection is, not only what happens, but also how it happens, when it happens, why it happens, and what is being affected. The style of most texts, besides being impersonal, is also very concise. It is because the author if he or she is trained in scienceis writing primarily for other scientists.

(7) In order to master technical English the learner must first acquire a thorough knowledge of everyday literary English with its grammar, vocabulary and rules of word formation. Then it will be easy to learn, step by step, the peculiarities of technical English. But scientific and technical literature understanding requires an additional training connected with the knowledge of specific terminology.

2.1 Skim the text. Which paragraph does each statement refer to?

1 The fact that the English language is the most widely spread in the world makes it the official language of many international organizations. _____

2 More complicated grammar structures are frequently used in scientific and technical writing. _____

3 The knowledge of terminology is of special importance for technical literature understanding. _____

4 The social and functional status of the language in the world often plays the most decisive role when a person chooses the language to study. _____

5 Conciseness is common for scientific and technical texts. _____

6 Many words of science and technology are of Latin origin. _____

7 The English language is a necessity in the opinion of most Europeans. _____

8 By means of language people can not only communicate but also express their natural and cultural values. _____

9 English is a foreign language for two-thirds of people who speak it. _____

2.2 Answer the following questions to the text.

1 Why is the importance of foreign languages knowledge constantly growing in the modern world?

2 Is it possible to calculate the exact number of languages?

3 Canwe consider language to bethe most important part of cultural identity?

4 What determines the status of any language in the world?

5 Why has the English language gained the status of the language of international communication?

6 What makes the English technical language understanding and writing rather difficult?

7 What are the peculiarities of the technical texts style?

8 What can be recommended to a learner to master technical English?

3 VOCABULARY

3.1 Match the following word pairs from the text to make up word partnerships.

1	native	**a**	values
2	cultural	**b**	survey
3	reference	**c**	status
4	social	**d**	books
5	recent	**e**	activity
6	practical	**f**	language
7	natural	**g**	distribution
8	numerical	**h**	processes
9	word	**i**	knowledge
10	thorough	**j**	formation values

3.2 What abstract nouns relate to each of the following adjectives?

cultural	_____	practical	_____
native	_____	natural	_____
functional	_____	scientific	_____

What verbs relate to the following abstract nouns?

administration	_____	construction	_____
connection	_____	combination	_____
consideration	_____	communication	_____

3.3 Fill in the appropriate forms.

verb	*noun*	*adjective*	*person*
communicate	communication	_____	_____
practise	practice	_____	_____
wonder	_____	wonderful	_____
model	_____	model	_____
borrow	_____	_____	borrower

3.4 Complete the sentences with the correct forms of the capitalized words in brackets.

Strategies for Successful English Language Learning

Research in the field of language indicates that there are many things you can do to become a **(1)** _____(SUCCESS) learner. Some people may have special abilities linguistically, but most of us can 'learn to learn' language **(2)** _____ (EFFECTIVE). **(3)** _____ (CURIOUS) about language and culture, **(4)** _____(DAY) study, and the **(5)** _____ (COMMIT) to use English in every possible situation while in an English-speaking environment are very **(6)** _____ (IMPORTANCE) conditions for success.

(7) _____ (MOTIVATE) and attitude play a **(8)** _____ (SIGNIFICANCE) role in successful language **(9)** _____ (LEARN). Listed here are some **(10)** _____ (USE) hints to encourage success in your new experiences. Combined with the expert **(11)** _____ (ASSIST) of **(12)** _____ (KNOWLEDGE) instructors and **(13)** _____ (RELY) intensive English programmes, attention to these ideas will help you gain focus in your studies so that you can learn English more **(14)** _____ (EFFECTIVE).

- Be clear and **(15)** _____ (REAL) about your goals. Be sure to select an intensive English programme that accommodates your language goals.
- Be realistic about the **(16)** _____ (LONG) of time it takes to learn a language.

- Be aware of your **(17)** _____ (LEARN) style.
- Learn something about 'language learning'. Do not be afraid of a language or afraid of **(18)** _____ (MAKE) errors. Learn from these mistakes.
- Take responsibility for your own learning. Participate **(19)** _____ (ACTIVE) in your programme. Look for opportunities to use your new language in any of many new environments. Be willing to make mistakes and learn from these mistakes. Focus on your goals, your study habits, and your **(20)** _____ (WILL) to 'learn to learn'. Enjoy the process! Find inside yourself the reasons you want to learn, and determine the ways to evaluate your success for yourself.

3.5 Complete the statements with the following words.

bilingual ***grammar*** ***accent*** ***dialects***
foreign ***slang*** ***native***

1 Musical people find it easy to develop a good _____ .

2 Extroverts find it easy to communicate in their _____ language and so often find it easy to learn to speak a _____ language fluently.

3 Flexible people can adapt to different _____.

4 _____ people are the people who know two languages.

5 Learners of languages should make an effort to learn everyday expressions and even _____.

6 Logical people find it easy to learn _____ rules.

3.6 Choose the right words to fit into the following paragraph.

process way writing technical people understand of facts

Technical writing is used as efficient and clear **(1)** _____ of explaining a product or **(2)** _____ aspect of production and how it works. Although the average many cannot **(3)** _____ this style and all of the jargon involved in this genre, technical **(4)** _____ is the preferred style by many industries. Technical writing is commonly read by a group of **(5)** _____ with a shared, advanced knowledge **(6)** _____ a particular subject. Technical writing is focused on explaining something or some **(7)** _____ in an industry, such as the product manufacturing procedure, the testing protocols, and giving the **(8)** _____ of an industry report.

4 LANGUAGE REVIEW

4.1 Match the sentences in the Present Simple with the correct description.

1	Skill comes with practice.	**a**	repeated or habitual actions
2	He kicks the ball and passes it to Hill.	**b**	general truths or laws of nature
3	The plane to London takes off at 6:50 am.	**c**	permanent situations or states
4	She regularly participates in scientific conferences.	**d**	timetables and programmes (future meaning)
5	If Helen speaks English better, she will apply for a job abroad.	**e**	subordinate clauses of time and condition
6	He works for one of the leading electric engineering companies.	**f**	state verbs describing a state rather than an action (verbs of perception, senses, some other verbs)
7	The cargo weighs 50 kg.	**g**	sports commentary, review, narration
8	I suppose their decision is right.	**h**	facts

4.2 Jane introduces Claude to Manfred in London. Complete the dialogue by putting each of the verbs in brackets into the correct form of the Present Simple. Reproduce the dialogue in groups of three.

Jane: Claude, **(1)** _____ (***you/know***) Manfred? Manfred **(2)** _____ (***be***) from Essen, but we met at the conference in Leeds last year. He **(3)**_____ (***know***) a lot about your company's operation.

Claude: Really! Well, I **(4)** _____ (***be***) very pleased to meet you, Manfred.

Manfred: Pleased to meet you too, Claude.

Claude: So, what exactly **(5)**_____ (***you/do***)?

Manfred: I **(6)**_____ (***work***) for a German electric power and natural gas public utility company. Our company**(7)**_____ (***contribute***) electricity and gas to more than 20 million electricity customers and 10million gas customers, principally in Europe.

Claude: Oh, so you **(8)**_____ (***be***) pretty big?

Manfred: Yes, RWE **(9)** _____ (***be***) the second largest electricity producer in Germany. We **(10)** _____ (***have***) a number of subsidiaries and **(11)** _____ (***employ***) more than 70,000 people. My job **(12)**_____

(***involve***) studying market trends and dealing with permanent customers.

Claude: Oh, that **(13)_____** (***be***) a lot of responsibility.

Manfred: Well, yes. And what about you?

Claude: I **(14)_____** (***work***) for Électricité de France which **(15)** _____ (***be***) one of the world's largest producers of electricity. EDF **(16)** _____ (***operate***) a diverse portfolio of 120,000+ megawatts of generation capacity in Europe, Latin America, Asia, the Middle-East and Africa.

Manfred: Oh, really? And **(17)** _____ (***you/often/come***) to London?

Claude: Yes, quite often. My company **(18)** _____ (***have***) an office here. It **(19)_____** (***not/take***) long to get here now, if you travel by Eurostar. Could I give you my card?

Manfred: Oh, yes. And I'll give you mine.

4.3 Place the following adverbs on the scale from the most to the least frequent and then add them to each sentence so that it is true for you.

almost always	***seldom***	***frequently***	***occasionally***
rarely	***hardly ever***	***never***	***almost never***
often	***usually***	***always***	

100% **50%** **0%**

sometimes

1	I drive to the university.	**7**	I go out on weekdays.
2	I get home from the university late.	**8**	I chat to people online.
3	I feel bored with my study.	**9**	My computer crashes.
4	I find time to relax and enjoy myself.	**10**	My friends go clubbing at weekends.
5	I spend much time doing my homework.	**11**	Our students read a lot of scientific literature.
6	I get acquainted with new people while I am travelling.	**12**	We participate in students' conferences.

4.4 Define appropriate personal pronouns.

A Underline the subject pronouns in each of the following sentences.

1 The cargo has arrived. It was delivered this morning.
2 He is more experienced than I am, but not as creative as Jonson.
3 These are my duties and what are yours? What are you responsible for?
4 She studied electricity and became an electrician.
5 Are you here for business or for pleasure?

B Underline the object pronouns in each of the following sentences.

1 When the sales manager comes in, tell him I phoned.
2 If you see Ann, please give her my regards.
3 The bank has sent me my new credit card.
4 Who is that?– It's them!
5 We won't be able to do business with you.

C Write 'S' if the pronoun in italics is a subject pronoun, or 'O' if the pronoun in italics is an object one.

1 ***It*** (__) has been an excellent course. I've enjoyed ***it*** (__)very much.
2 E-mails have become a real nuisance. I receive dozens of ***them*** (__) every day.
3 ***It*** (__) wasn't his idea, it was mine . ***I*** (__) was the first who suggested these changes.
4 ***They*** (__) got in touch with ***us*** (__) when ***we*** (__) were developing a new installation.
5 ***You*** (__) bought new equipment, but you really don't need ***it*** (__) .

5 SKILLS

MAKING NEW CONTACTS. INTERVIEWING.

Work in pairs. Interview each other to complete the profiles. Prepare the questions that you will need in order to complete the profiles.

Student A	***Student B***
Name: Maxwell K. Smith	**Name: Luis Menga**
Age: 35	**Age: _____**
Nationality: American	**Nationality: _____**
Marital status: married	**Marital status: _____**

Salary: $48,000 per annum
Company: Columbia Heights
Present position: Electrical Engineer

Background:
University of Illinois, Champaign, IL
Master's in Electrical Engineering Technology (May 2002)

University of Minnesota, Minneapolis,
Bachelor of Science in Electrical Engineering (May 1998)

Present responsibilities:
- Prepare electrical drawings and specifications.
- Manage project schedules and budgets, and obtain permits for operations.
- Make engineering calculations in accordance with field and office assignments.
- Investigate problems and recommend solutions.
- Ensure compliance with safety requirements and standard procedures.
- Prepare requests for proposals and evaluate bids.
- Estimate cash flow projections.

Perform highly specialized design, research, and analysis on a project-by-project basis and advise on code compliance.

Salary: _____
Company: _____
Present position:_____
_____

Background:
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Present responsibilities: _____
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Student B

Name:

Age: _____

Nationality: _____

Marital status: _____

Salary: _____

Company: _____

Present position: _____

_____

Background: _____

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Present responsibilities: _____

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Student A

Name: Luis Menga

Age: 31

Nationality: Brazilian

Marital status: single

Salary: 40,000 per annum

Company: Global Electrical Engineering Inc., Austin, Texas

Present position: Electrical Engineer

Background:

Bachelor of Electrical Engineering, Idaho State University, 2002

Circuits and Power Systems, Diploma, Arlington Technical Institute, 2002

Present responsibilities:

- Perform Short-Circuit, Coordination and Arc-Flash Studies on electrical distribution systems of hospitals, schools, office buildings, industrial sites, etc.
- Perform site surveys to gather electrical equipment details needed to do Power System Studies.
- Design, draft original and revised drawings for engine control systems, remote monitoring and control systems and other electrical systems as required
- Prepare bills of materials for projects, create operating procedures for custom designed projects
- Work with other departments as a team to ensure consistent quality and coordinated effort
- Assist and troubleshoot electrical issues at customer sites

UNIT 2

1 LEAD-IN

1 What are the main challenges of education?

2 What initiatives to promote education as a fundamental human right do you know?

3 Is it worth getting higher education nowadays? What advantages does it provide?

4 In small groups conduct a survey asking your classmates about their career choice. Complete the chart below. Put the answers of different groups together and prepare the statistics.

Why did you decide to enter the higher education institution?

Student 1 _____

Student 2 _____

Student 3 _____

Who recommended it to you or encouraged your choice?

Student 1 _____

Student 2 _____

Student 3 _____

What do you know about the modes of study, courses provided and degrees granted?

Student 1 _____

Student 2 _____

Student 3 _____

Why did you give your preference to the Power Supply and City Lighting department?

Student 1 _____

Student 2 _____

Student 3 _____

What are your future career plans?

Student 1 _____

Student 2 _____

Student 3 _____

2 READING

TEXT A

O. M. BEKETOV NATIONAL UNIVERSITY OF URBAN ECONOMY IN KHARKIV

O. M. Beketov National University of Urban Economy in Kharkiv, known locally as HNUMG, is one of the top universities in Ukraine. It has a well-established position as one of the country's leading universities training specialists for different fields of municipal economy. This makes university the most popular destination for students who want to get the top-quality education in a diverse range of fields such asmunicipal construction, electric transport, electric and energy supply, water and gas supply, municipal enterprises management, urban ecology, hospitality and tourism.

The students may come straight from school or college. They are enrolled for degree progammes(Bachelor Degree, Specialist Degree and Master Degree) and they get postgraduate diplomas. The doors are also open to undergraduates (who have the Master's degree) and mature students with different backgrounds. They choose from the selection of undergraduate and postgraduate programmes, complete the course of studies and get the degrees of Candidates and Doctors of Sciences.

More than 16,000 students study at the university. Some 650 international students from 42 countries choose our university.

The university's branches work successfully in Greece and Israel. The university also has close scientific and business contacts with higher education institutions , scientific and research institutions from 11 countries of the world, among them are France, Germany, Finland, the USA, Great Britain, Sweden, Netherlands, Israel, etc.

Established in 1922, the university now has the departments of Town Planning and Development, Economics and Entrepreneurship, Management, Urban Engineering Ecology, Power Supply and City Lighting, City Electric Transport as well as the Postgraduate Department wherethe scientific and academic personnel is being trained at.

There are also the Department of Upgrading Skills and Retraining, the Correspondence Department, the Department for Foreign Students and the

Preparatory Department.

The learning and teaching standards of the university are rated among the best in Ukraine. The students have the access to a wide range of staff experience. The teaching staff includes 500 gifted and dedicatedteachers, 70 Professors and Doctors of Sciences, more than 300 PhD lecturers. Eight world-standard schools, headed by Doctors of Sciences, Professors, Assistant Professors, and PhD lecturers, successfully function at the University.

The students pursue the academic programmes in a diversity of different subject areas coupled with extensive curricula activities. The students use a range of learning styles and techniques including lectures, seminars, tutorials, as well as undertake fieldwork and experience both individual study and group work. They prepare essays and make oral presentations, work on Department research projects, acquire necessary skills and knowledge.

Up-to-date facilities are available in well-equipped laboratories and lecture theatres. The eleven branch scientific and research laboratories, namely "Megapolis Centre", the engineering centre of phyto-technologies, the Laboratory of Academic Scientific and Research Complex (ASRC), have gained the international reputation.

Many students leave home, so the university offers six hostels with communal living rooms and facilities for studies, living, cooking, recreation and holding various events. Indoor and outdoor sporting activities are catered for by sports centres which are in student-friendly areas. There is a lively Students' Union with numerable societies covering a wide range of interests.

The university possesses a great library both in terms of books with the stock of 882,000 volumes and online resources where the students can fulfil their every academic need or simply indulge their intellectual curiosity. As far as the on-line learning is concerned, there is an innovative development which supports learning and teaching activities across the Internet according to special academic programmes. This on-line environment enables quick and easy provision of materials, the communication tools and support for collaborative project work.

There are also dining halls, cafes, self-service catering facilities and cash machines within easy access from different buildings of the university.

The quality of education is recognized by those who are keen on recruiting graduates from the University into a broad range of careers and who provide them with full-time work or with the opportunity of getting casual jobs.

2.1 Answer the following questions to the text.

1 What different fields are the students of O.M. Beketov National University of Urban Economy in Kharkiv trained in?

2 How many students are currently enrolled?

3 What programmes of training does the university provide?

4 Is there any possibility for international students to take the university courses?

5 What departments are the students trained at?

6 What scientific and branch laboratories have gained the international reputation?

7 What is the university recognized nationally for?

8 What facilities does the university possess to provide effective learning?

9 Does the university provide a post-graduate course?

10 What diplomas do the students get according to the level of training?

TEXT B
FIRST EUROPEAN UNIVERSITIES

'A university should be a place of light, of liberty and of learning.'
Benjamin Disraeli

A university is an institution of higher education and research, which grants academic degrees in a variety of subjects. A university is a corporation that provides both undergraduate education and postgraduate education. The word university is derived from the Latin *universitas magistrorum et scholarium*, roughly meaning 'community of teachers and scholars.' The original Latin word referred to degree-granting institutions of learning in Western Europe where this form of legal organization was prevalent, and from where the institution spread around the world.

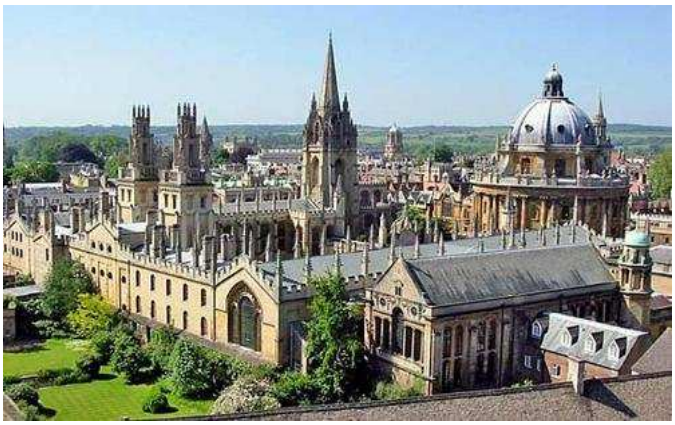
Prior to their formal establishment, many medieval universities were run for hundreds of years as Christian cathedral schools or monastic schools, in which monks and nuns taught classes; the evidence of these immediate forerunners of the later university at many places dates back to the 6th century AD.

The first universities with formally established guilds in Europe were the University of Bologna (1088), the University of Paris (1150), later associated with the Sorbonne), the University of Oxford (1167), the University of Palencia (1208), the University of Cambridge (1209), the University of Salamanca (1218), the University of Montpellier (1220), the University of Padua (1222), the University of Naples Federico II (1224), the University of Toulouse (1229).

The University of Bologna (Italian: Alma Mater Studiorum Università di Bologna, UNIBO) is the oldest continually operating university in the world, the word 'universitas' being first used by this institution at its foundation. The true date of its founding is uncertain, but believed by most accounts to have been 1088. Since 2000, the University's motto has been Alma mater studiorum (Latin for 'fostering mother of studies'). The university is historically notable for its teaching of canon and civil law. Until modern times, the only degree granted at that university was the doctorate. The University counts about 100,000 students in its 23 faculties. It has a number of branch centers in Italy and a branch center abroad in Buenos Aires.

The University of Paris was founded in the mid 12th century, and officially recognized as a university probably between 1160 and 1170. After many changes, it ceased to exist in 1970, and 13 autonomous universities were created from it. The university is often referred to as the Sorbonne or La Sorbonne after the collegiate institution founded about 1257 by Robert de Sorbon. The university had four faculties: Arts, Medicine, Law, and Theology. The Faculty of Arts was the lowest in rank, but also the largest as students had to graduate there to be admitted to one of the higher faculties. The students were divided into four nations according to language or regional origin: France, Normandy, Picardy, and England. The faculty and nation system of the University of Paris (along

with that of the University of Bologna) became the model for all later medieval universities. Under the governance of the Church, students wore robes and shaved the tops of their heads in tonsure, to signify they were under the protection of the church. Students operated according to the rules and laws of the Church and were not subject to the king's laws or courts. Students were often very young, entering the school at the age **of** 13 or 14 and staying for 6 to 12 years.



The University of Oxford is a university located in Oxford, United Kingdom. It is the second oldest surviving university in the world and the oldest university in the English-speaking world. Although the exact date of foundation remains unclear, there is evidence of teaching there as far back as the 11th century. The University grew rapidly from 1167 when Henry II banned English students from attending the University of Paris. After disputes between students and Oxford townsfolk in 1209, some academics fled north-east to Cambridge, where they established what became the University of Cambridge. The two 'ancient universities' have many common features and are often jointly referred to as Oxbridge. In addition to cultural and practical associations as a historic part of British society, the two universities have a long history of rivalry with each other. Most undergraduate teaching at Oxford is organized around weekly essay-based tutorials at self-governing colleges and halls, supported by lectures and laboratory classes organized by University faculties and departments. League tables consistently list Oxford as one of the UK's best universities, and Oxford consistently ranks in the world's top 10.

In Europe, young men proceeded to university when they had completed their study of the *trivium*–the preparatory arts of grammar, rhetoric and dialectic or logic–and the *quadrivium*: arithmetic, geometry, music, and astronomy.

The end of the medieval period marked the beginning of the transformation of universities that would eventually result in the modern research university. Many external influences, such as eras of humanism, Enlightenment, Reformation and Revolution, shaped research universities

during their development.

By the 18th century, universities published their own research journals and by the 19th century, the German and the French university models had arisen. The German, or Humboldtian model, was conceived by Wilhelm von Humboldt and based on Friedrich Schleiermacher's liberal ideas pertaining to the importance of freedom, seminars, and laboratories in universities. The French university model involved strict discipline and control over every aspect of the university.

Until the 19th century, religion played a significant role in university curriculum; however, the role of religion in research universities decreased in the 19th century, and by the end of the 19th century, the German university model had spread around the world. Universities concentrated on science in the 19th and 20th centuries and became increasingly accessible to the masses. In Britain the move from industrial revolution to modernity saw the arrival of new civic universities with an emphasis on science and engineering. The British also established universities worldwide, and higher education became available to the masses not only in Europe. In a general sense, the basic structure and aims of universities have remained constant over the years.

Although each institution is organized differently, nearly all universities have a board of trustees; a president, chancellor, or rector; at least one vice president, vice-chancellor, or vice-rector; and deans of various divisions. Universities are generally divided into a number of academic departments, schools or faculties. Public university systems are ruled over by government-run higher education boards. They review financial requests and budget proposals and then allocate funds for each university in the system. They also approve new programs of instruction and cancel or make changes in existing programs. In addition, they plan for the further coordinated growth and development of the various institutions of higher education in the state or country. However, many public universities in the world have a considerable degree of financial, research and pedagogical autonomy. Private universities are privately funded and generally have a broader independence from state policies.

Despite the variable policies, the universities are usually among the foremost research and advanced training providers in every society. Most universities not only offer courses in subjects ranging from the natural sciences, engineering, architecture or medicine, to sports sciences, social sciences, law or humanities, they also offer many amenities to their students' population

including a variety of places to eat, banks, bookshops, print shops, job centers, and bars. In addition, universities have a range of facilities like libraries, sports centers, students' unions, computer labs, and research laboratories. In a number of countries, major classic universities usually have their own botanical gardens, astronomical observatories, business incubators and university hospitals.

2.2 Mark the statements as true (T) or false (F).

1 A university is an institution of higher education and research granting academic degrees and providing undergraduate as well as postgraduate education. ___

2 The word *university* is of Latin origin. ___

3 The university as the institution spread around the world from Eastern Europe. ___

4 In many medieval universities classes were taught by monks and nuns. ___

5 The University of Oxford is considered to be the oldest continually operating university in the world. ___

6 The University of Bologna was founded in 1088. ___

7 The University of Bologna is historically notable for its teaching of medicine. ___

8 Until modern times, The University of Bologna granted only the doctorate degree. ___

9 The University of Paris was founded in the mid 14th century. ___

10 13 autonomous universities were created from the University of Paris after it ceased to exist in 1970. ___

11 The University of Paris is often referred to as the Sorbonne because it was founded by Robert de Sorbon. ___

12 The robes students wore at the University of Paris and the shaved tops of heads signified that the students were under the protection of the king. ___

13 The University of Cambridge is considered to be the oldest university in the English-speaking world. ___

14 The University of Oxford and the University of Cambridge are often jointly referred to as Oxbridge because they have many common features and a long history. ___

15 The two most ancient universities in Britain have a long history of rivalry with each other. ___

16 At the end of the medieval period the universities began to transform into the modern research universities. ___

17 Universities managed to publish their own research journals only after the 18th century. ___

18 By the 19th century the German and the French university models had appeared. ___

19 The French university model was based on the ideas pertaining to the importance of freedom, seminars, and laboratories in universities. ___

20 The German university model involved strict discipline and control over every aspect of the university. ___

21 By the end of the 20th century, the German university model had spread around the world. ___

22 In the 19th and 20th centuries universities concentrated on science and became increasingly accessible to the masses. ___

23 Generally, the basic structure and aims of universities have greatly changed over the years. ___

24 Many public universities in the world have a considerable degree of financial, research and pedagogical autonomy. ___

25 The universities usually take the lead in research and advanced training in every society. ___

2.3 The following statements reproduce the main ideas of Text 2 but they are mixed. Rearrange the statements in the order they appear in the text. Make a short summary of the information about the first European universities.

___ Most universities offer courses in different subjects and have a range of facilities.

___ To enter the university the young men had to complete the study of the *trivium* and the *quadrivium.*

___ The role of religion in research universities decreased by the end of the 19th century.

_**1**_ The word university means ‘community of teachers and scholars.’

___ After disputes between students and Oxford townsfolk some academics fled to Cambridge and established the University of Cambridge.

___ Oxford and Cambridge universities are often jointly referred to as Oxbridge. They have many common features but a long history of rivalry as well.
___ The first universities in Europe date back to the 11th – 13th centuries.
___ The forerunners of the later universities which were run as Christian cathedral schools date back to the 6th century AD.
___ Each institution is organized differently but nearly all universities have a board of trustees.
___ The University of Bologna is the oldest continually operating university in the world.
___ The modern research university emerged at the end of medieval period.
___ The University of Paris was founded in the mid 12th century but after many changes it ceased to exist and 13 autonomous universities were created from it.
___ The University of Oxford which appeared in the 11th century is supposed to be the second oldest surviving university in the world.

3 VOCABULARY

3.1 Match the words and phrases with the definitions.

1	graduate	**a**	document showing that someone has successfully completed a course of study or passed an examination
2	language laboratory	**b**	an amount of money that is given to someone by an educational organization to help pay for their education
3	lecture	**c**	someone who is studying at a university to get a master's degree or a PhD
4	scholarship	**d**	a spoken or written test of knowledge, especially an important one
5	canteen	**e**	the person in charge of colleges, universities
6	diploma	**f**	a room in a school or college where you can learn to speak a foreign language by listening to tapes and recording your own voice
7	undergraduate	**g**	a large dining hall in a university
8	exam	**h**	someone who has completed a university degree, especially a first degree

9	faculty	**i**	a long talk on a particular subject that someone gives to a group of people, especially to students in a university
10	postgraduate	**j**	a class at a university or college for a small group of students and a teacher to study or discuss a particular subject
11	rector	**k**	a block of flats where students live
12	hostel	**l**	a student at college or university, who is working for their first degree
13	seminar	**m**	a long piece of written research done for a higher university degree, especially a PhD
14	dissertation	**n**	a department or group of related departments within a university

3.2 What verbs relate to the following abstract nouns?

embodiment	_____	education	_____
establishment	_____	institution	_____
development	_____	foundation	_____

What abstract nouns relate to the following verbs?

coordinate	_____	operate	_____
create	_____	publish	_____
decorate	_____	research	_____

What adjectives relate to the following adverbs?

consistently	_____	generally	_____
differently	_____	privately	_____
eventually	_____	usually	_____

3.3Fill in the appropriate forms. Use a dictionary to help you, if necessary.

adjective	***noun***	***verb***
academic	_____	_____
financial	_____	_____
formal	_____	_____
industrial	_____	_____
original	_____	_____

3.4 Match the left and the right sides to make up word partnerships.

1	to grant	**a**	undergraduate education
2	to provide	**b**	academic degree
3	to cease	**c**	university
4	to proceed to	**d**	to exist
5	to spread	**e**	accessible to the masses
6	to become	**f**	around the world
7	to establish	**g**	courses in subjects
8	to offer	**h**	universities
9	to have	**i**	research university
10	to result in	**j**	a range of facilities the modern

3.5 Use the following collocations to explain what makes the university life *exciting, worrying, confusing, interesting, encouraging, motivating, boring, amusing, annoying, depressing, embarrassing.*

to enter the university	to attend lectures	to retake examinations
to pass entrance exams	to take notes	to conduct research
to be a first-year student	to do homework	to write essays
to lag behind	to come late to classes	to make reports
to keep pace	to crib at exams	to work in the library
to miss classes	to correct mistakes	to work on thesis
to get an excellent mark	to fail the exam	to graduate with honours
to get a bad mark	to cheat	to defend a diploma
to pass an examination session	to lose a student membership card	to take a postgraduate course
to learn a foreign language	to participate in research projects	to obtain a degree

3.6 Choose the right words to fit into the following paragraph.

women foreign schools languages universities countries

Student Migrations and the Feminisation of European Universities

The end of the nineteenth century saw the emergence of two new categories of students in Western **(1)** _____ : foreigners and women. This trend manifested itself mainly in **(2)** _____ with a dense, well-developed university network such as Switzerland, France, Germany, the Austro-Hungarian Empire

and Belgium. The Italian, Spanish, English, Scottish, Dutch or Scandinavian universities were less affected by this wave, and the number of **(3)** _____ students they hosted remained relatively slight given, among other things, the fact that their **(4)** _____ of instruction were rarely studied in the **(5)** _____ of the other European countries. The presence of **(6)** _____ was also less important in these universities and mainly consisted of natives of each country concerned.

4 LANGUAGE REVIEW

4.1 Write the plurals of the following words and use them in the sentences of your own.

company	_____	city	_____
person	_____	phenomenon	_____
man	_____	idea	_____
father-in-law	_____	CEO	_____
fax	_____	photo	_____
passer-by	_____	child	_____
crisis	_____	parking space	_____
breakdown	_____	woman	_____

4.2 Choose the correct option.

1 There ***isn't/aren't much/many*** light in the hall.
2 The police ***has/have*** a lot of witnesses.
3 There ***was/were*** too ***much/many*** people in the exhibition hall.
4 ***That/Those*** lighting installations ***was/were*** very efficient.
5 Mathematics ***is/are*** really the Queen of Sciences.
6 ***This/these*** data ***was/were*** obtained yesterday.
7 The team ***is/are*** all working hard on a new project.
8 My luggage ***is/are*** in the car already.
9 The staff ***is/are*** all taking a training course.
10 It is a well known fact that no news ***is/are*** good news.
11 The money on the desk ***is/are*** for your business trip expenses.

4.3 Rewrite the sentences in the plural making necessary changes.

1 She has an important task. _____
2 There's an urgent problem left. _____

3 The man is going to the head office. _____

4 This copy is damaged. _____

5 She often gets in touch with customers. _____

6 That draft has a terrible mistake. _____

4.4 Complete the sentences with *a*/*an*, *the* or no article.

1 His father works as _____ electrician.

2 What do you usually order in your factory canteen for _____ lunch?

3 Where is _____ USB drive I lent you yesterday?

4 Our car does 150 miles _____ hour.

5 _____ smog is a problem in _____ big cities.

6 They get to the office by _____ bus.

7 I'm very interested in _____ education. It is important to receive _____ good education.

8 Is this _____ first time you have won the grant?

9 _____ life is very difficult for unemployed these days.

10 I saw _____ advertisement this morning. I think it must have been _____ same one that I saw last week.

11 She lost _____ important document and was fired.

12 _____ telephone was invented by Alexander Bell.

13 He plays _____ violin pretty well.

14 This is _____ excellent chance to get a good job.

15 She took _____ six-month computer course.

16 Do you always tell _____ truth?

17 Thank you, Anna, _____ idea you suggested was really valuable.

4.5 Underline the correct options in the dialogue. Reproduce it in pairs.

Linda: Michael, have you got **(1)*a/some***moment for a chat?

Michael: Of course, go ahead.

Linda: There **(2)*is/are*****(3)*a/some*** important work that we need to do over the next few months. It is **(4)*a/some*** challenging job and I think you're the best **(5)*person/people*** to cope with it.

Michael: Do you really think so?

Linda: Yes. We are going to install **(6)*a/some*** new wind turbines to increase the capacity.

Michael: Uh, I see …

Linda: And, as you know, we haven't got **(7)*many/much*** space at our present site. Well, we think it's **(8) *an/some***ideal opportunity to expand.

Michael: Yes, I absolutely agree.

Linda: We'd like you to do **(9)*a/some*** research on the whole idea, and then write **(10)*a/some*** report on whether to go ahead or not. Would you like to join us?

Michael: Well, actually, I haven't got **(11)*much/many*** experience in this kind of thing.

Linda: I know, but there really **(12)*isn't/aren't*** anyone else here who most ideally suits to do it. And we need to make **(13)*a progress/progress***as quickly as possible.

Michael: Um, right, but there **(14)*is/are*****(15)*many/much*****(16) *information/informations*** to collect.

Linda: And what is more, with this new responsibility we are going to review your salary.

Michael: Well, that sounds like **(17) *a/an***interesting idea. I'll try to do my best.

5 SKILLS

PROGECT WORK

Prepare and present the information about one of the world famous universities. Use the Internet resources available and try to find facts that can be helpful in your presentation.

- ***Name of the University*** _____
- ***Location and buildings*** _____
- ***Date of foundation*** _____
- ***Key facts from the history of the educational institution*** _____
- ***Notable alumni, professors and former students*** _____
- ***World ranking and reputation*** _____
- ***Educational courses provided*** _____
- ***Degrees granted*** _____
- ***Students' life*** _____

UNIT 3

1 LEAD-IN

1 What do you know about the Bologna Process? Why is it called so? What is its purpose?

2 How many countries signed the Bologna declaration? Where and when was it signed?

3 What are the goals of the European Higher Education Area creation?

4 What are the major reforms foreseen by the Bologna Process?

5 When was the European Credit Transfer System (ECTS) implemented in Ukraine? Is it successful? What does it provide?

6 Would you like to take an educational course abroad in the future? Why?/Why not?

2 READING

TEXT A

'Knowledge is a city, to the building of which every human being brought a stone.'

Ralph W. Emerson

'Knowledge is power.'

Francis Bacon

UKRAINE'S NATIONAL HIGHER EDUCATION SYSTEM

In Ukraine, as in many other countries, higher education is considered to be one of the main human values. Ukraine has inherited from the past a well-developed and multifunctional system of higher education. Many factors of modern life such as the standard of living, mental and physical health, social position, the fast change in technologies and equipment worldwide requiredthe creation of a system that would allow Ukraine to become the ever-educated nation. Nowadays the national higher education system **is**based on the new grounds. It provides for the entirely new level of experts' training, theimprovement in academic and professional mobilityof graduates, greater openness, democratic principles of teaching the youth, the access of Ukraine's higher education system to the world

community.

Higher education in Ukraine has a long and rich history. Its students, graduates and academicians have long been known and appreciated worldwide. The pioneering research of scholars working in the country's higher education institutions and academies, such as Dmytro Mendeleyev, Mykola Zhukovsky, and Yeugeny Paton, are part of the universal history of scientific progress.

The first higher education institutions (HEIs) emerged in Ukraine in the late 16th and early 17th centuries. The first Ukrainian higher education institution was Ostrozka School, or Ostrozkiy Greek-Slavic-Latin Collegium, similar to Western European higher education institutions of the time. Established in 1576 in the town of Ostrog, the Collegium was the first higher education institution in the Eastern Slavic territories. The oldest university was Kyiv Mohyla Academy, first established in 1632 and officially recognized by the government of Imperial Russia as a higher education institution in 1694. Among the oldest is also Lviv University, founded in 1661. More higher education institutions were set up in the 19th century, beginning with universities in Kharkiv (1805), Kiev (1834), Odessa (1865), and Chernivtsi (1875) and a number of professional higher education institutions, e.g.: Nizhyn Historical and Philological Institute (originally established as the Gymnasium of Higher Sciences in 1805), a Veterinary Institute (1873) and a Technological Institute (1885) in Kharkiv, a Polytechnic Institute in Kiev (1898) and a Higher Mining School (1899) in Katerynoslav. The Soviet period is known for rapid growth of higher education institutions. By 1988 the number of higher education institutions increased to 146 with over 850,000 students.

The higher education system consists of higher education institutions, scientific and methodological facilities under federal and municipal governments and self-governing bodies which are in charge of organizing the training process. The higher education systemhas two major educational levels, namely, basic higher education and full higher education. The educational level is the trait of higher education by the level of gained quality that provides comprehensive development of an individual to get an appropriate

qualification. The legislation sets the following educational and qualification levels - junior specialist, bachelor, specialist, master, as well as scientific degrees of candidate of sciences (assistant professor) and doctor of sciences (Ph. D.). The educational and qualification level is the trait of higher education system by the level of gained qualities that will enablethe individual to perform the appropriate occupational tasks or responsibilities at the level relevant to a certain qualification. Senior scientific researcher, assistant professor and professor are the applied degrees.

According to the HEIs status there are four levels of accreditation. Currently, the Ukraine's higher education system comprises 327 technical vocational schools, 216 vocational schools, 117 colleges, 149 institutes including two conservatories, 48 academies and 81 universities.

The Ukrainians study in their native language, while foreign students have a choice between either the native language or English. Foreign students who opt to study in Ukrainian or Russian do a one-year preparatory language course and preparatory courses relevant to their future profession. Students taught in the English language skip this preparatory stage, but study the language taking an independent course while mastering the academic programme.

An academic year lasts from 1 September to 31 June. It is split into two semesters having a brief two-week winter break in January, and a long vacation from 1st of July to 31st of August.

Since the mid-90s, Ukraine has reformed its education frameworks consistently with the Bologna Process. The latter is named after the place where it was proposed, that is the University of Bologna in the Italian city of Bologna and whereMinisters of Education from 29 European countries signed the Bologna declarationin 1999. The aim of the Bologna Process is to create the European Higher Education Area (EHEA) based on the international cooperation and academic exchange that is attractiveto European students and staff as well as to students and staff from other parts of the world. The European Higher Education Areais supposed to facilitate the mobilityof

students, graduates and higher education staff; to prepare students for their future careers and life in the community, and to support their personal development; to offer a broad access to top-quality higher education, based on democratic principles and academic freedom.

HEIs graduatesget state standard diplomas after they complete education in accordance with Educational Proficiency Plans.They obtain the following educational and qualification levels: junior specialist (three years of study on a basis of full comprehensive secondary education), bachelor (four years on a basis of full comprehensive secondary education), specialist (one year on a basis of the first degree), and master (one year on a basis of the first degree).

Ukraine's system of higher education provides pathways into rewarding careers and opportunities to find employment in a wide range of industries and organizations both at home and abroad.

2.1 Answer the following questions to the text.

1 What educational system has Ukraine inherited from the past?
2 What should Ukraine's modern system of education be based on?
3 What famous Ukrainian scholars have been known and appreciated worldwide?
4 When did the first higher education institutions appear in Ukraine?
5 What is the oldest university in Ukraine that was officially recognized as a higher education institution?
6 What does the higher education system in Ukraine consist of?
7 What major educational levels are provided in Ukraine?
8 How many levels of accreditation are there in the country? What are they specified by?
9 What programme helps foreign students to cope with the demands for the learning process in Ukraine?
10 How long does the academic year last?
11 What makes Ukraine implement some reforms in its education frameworks?

2.2 Match the sentence beginnings (1–8) to the correct endings (a–h).

1 Being based on the new grounds, a new higher education system in Ukraine is expected to provide …
2 The researches of Ukrainian scholars who graduated from or continue working in the country's higher education institutions …

3 The history of higher education in Ukraine dates back …

4 Ostrozkiy Greek-Slavic-Latin Collegium was the first Ukrainian higher education institution and …

5 The system of higher education in Ukraine comprises …

6 The educational and qualification levelprovides the qualities gainedwhile studying at a higher education institution …

7 If foreign students choose to study in Ukrainian or Russian, …

8 The Bologna Process is a series of agreements between European countries designed to ensure comparability in the standards and quality of higher education qualifications …

a tothe late 16th and early 17th centuries.

b higher education institutions, scientific and methodological facilities under federal and municipal governments and self-governing bodies which are in charge of organizing the training process.

c higher quality of proficiency, academic and professional mobility of graduates and favourable conditions to join the higher education system of the world community.

d they have to do a one year preparatory language course and preparatory courses relevant to their future profession.

e was similar tothe Western European higher education institutions of the time.

f have always beenfamous worldwide.

g which enable a graduate to perform the appropriate occupational tasks or responsibilities.

h which will support the students' personal development and offer a broad access to top-quality higher education.

TEXT B

2.3 Read the text about higher education in Great Britain quickly. Using the skimming technique, identify which paragraph gives information about

1 the degrees the students are awarded

2 the requirements the students of the Open University should do

3 the fees the students of higher education institutions have to pay

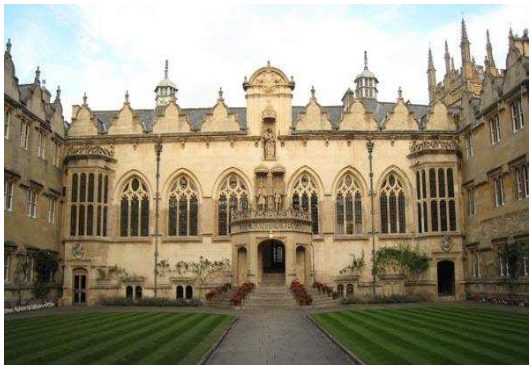
4 the possibility of receiving a grant to study at a higher education institution

5 the oldest and worldwide known universities in Britain

HIGHER EDUCATION IN GREAT BRITAIN

A All British universities are private institutions. Students have to pay fees and living costs, but every student may get a personal grant from local authorities. If the parents do not earn much money, their children receive a full grant which covers all the expenses. Students studying for first degrees are known as ‘undergraduates’. New undergraduates in some universities are called ‘fresher’. They have lectures and regular seminars.

B After three or four years the students take their finals. Those who pass examinations successfully are awarded the Bachelor’s degree: Bachelor of Arts for History or Bachelor of Science. The first postgraduate degree is Master of Arts, Master of Science. Doctor of Philosophy is the highest degree. It is awarded for some original research work which is an important contribution to a field of knowledge. Open Days are a chance for applicants to see the university, meet students and staff, learn more about the university, facilities and the course content.All this helpsan applicant decide whether the choice is right.



C The most famous universities in Britain are Oxford and Cambridge. They are the two oldest English universities and they both have a long and eventful history of their own. Oxford and Cambridge are regarded as being academically superior to other universities and as giving special privilege and prestige. Cambridge University consists of a group of 32 independent colleges. The first students came to the city in 1209 and studied in the schools of the cathedral and monasteries.

D Further education in Britain is for people over 16 who can docourses at various levels up to the standard ones required to enter a higher educationinstitution. The Open University offers degrees for people who do not have

a formal education and qualifications, or who are older than 16. Students study at home and then post their works off to a tutor for marking. Most courses last six years to be completed and students get a number of credits for each year's work. The Open University was founded in 1969 and started its first course in 1971. About 120, 000 people have enrolled since then.

2.4 Answer the following questions to the text.

1 Why do British students have to pay fees and living costs?
2 How can local authorities support students?
3 Who are called 'freshers'?
4 When do the British students receive the Bachelor's degree?
5 What are the grounds to award the highest degree, i.e. the Doctor of Philosophy?
6 What British universities are considered to be the oldest and given special privilege?
7 Which of the Universities in Britain does not take into account for entry the students' previous academic achievements?
8 How is the educational processorganized at the Open University?

3 VOCABULARY

3.1 Make up the word partnerships.

1	to complete / provide	**a**	a personal grant
2	to get	**b**	education
3	to undergo	**c**	the mobility of students
4	to facilitate	**d**	a study of language
5	to award a state	**e**	examinations
6	to pass	**f**	standard diploma
7	to study	**g**	of proficiency
8	to receive a certificate	**h**	in one's national language
9	to prepare	**i**	courses

3.2 Fill in the appropriate forms.

noun (person)	***noun (phenomenon)***	***verb***	***adjective***
_____	_____	inherit	_____
_____	establishment	_____	_____

_____	_____	_____	educated
_____	_____	emerge	_____
trainer	_____	_____	_____
_____	recognition	_____	_____
applicant	_____	_____	_____
_____	_____	provide	_____
_____	facilitation	_____	_____

3.3 Fill in the gaps with the words denoting a specialist in the particular field.

science	***scientist***	***science***	***scientist***
chemistry	_____	cybernetics	_____
physics	_____	astrophysics	_____
zoology	_____	civil engineering	_____
genetics	_____	information	_____
		technology	_____

3.4 Complete the phrases with the words given below.

information	an electrical engineer
technology	an industrial engineer
power engineering	an lighting engineer
the media	set up my own business
the lighting industry	open a shop
the electric power industry	make a career in engineering

I'd like to work in … _____
_____
_____
_____
_____
_____

I'd like to be … _____
_____
_____

I'd like to … _____
_____
_____

3.5 Complete the paragraph with correct alternatives.

degree	***courses***	***family***	***fees***	***home***	***low***
year	***jobs***	***students***	***loans***	***leave***	

At 18, British school-leavers with A-level can apply for a **(1)** _____course at university. Most of these **(2)** _____ last for three years, and students must pay all of their own accommodation and living costs, and some of their tuition **(3)** _____. Since 1990, the government has offered student loans to help the situation. The **(4)** _____ are between 3,000 and 5,000 per **(5)** _____ depending on whether students live with their parent or away from **(6)** _____, and also whether or not they live in London.

Students have to pay back their loans when they **(7)** _____ university, but not until their income reaches 10,000 per year. The interest rates are **(8)** _____ and there is no deadline for repayment. However, most **(9)** _____ find that the loans do not fully meet their needs, so many have to stay in the **(10)** _____ home to avoid accommodation costs, or take part-time **(11)** _____ while they are studying.

3.6 Choose the right words to fit into the following paragraph.

religion	***state***	***research***	***fees***
colleges	***faiths***	***specific***	***undergraduates***

Higher Education System in the USA

There are more than 3,500 colleges and universities in the United States. A college is usually for **(1)** _____, whereas a university is a collection of one or more **(2)** _____, plus a graduate school and various professional schools. Colleges mainly teach but universities, with their large numbers of graduate students, also place emphasis on **(3)** _____.

The American Higher Education System can be divided into the following categories:

- Public schools are funded by the **(4)** _____ and the local government of the area in which they are located. Community colleges grant associate degrees after two years of study. Students who plan to earn Bachelor's degrees can attend Associate in Arts or Associate in Sciences degree programmes which are designed to parallel the first two years of study in a four-year institution (2-year community college,4-year state college, Graduate university, some vocational schools).

- Private schools are organized in the same manner as other colleges, but generally have **(5)** _____ much higher than those of the public schools. These schools are owned by private non-governmental individuals and boards of directors. Their funding is primarily from the tuition they charge and private contributions (2-year college, 4-year college, Graduate University).
- Religiously affiliated colleges and universities are all privately owned and operated. They are predominantly Christian, although some are Jewish, Islamic and other **(6)** _____ . These institutions offer general coursework, but they also offer and sometimes require participation in **(7)** _____ courses. In general, one need not be a member of a particular church or religious group to attend a religiously affiliated college in the U.S., and enrollment in such an institution will not impinge on one's own religious practices.
- Proprietary Schools are usually operated by an individual or a corporate owner. These schools generally concentrate on **(8)** _____ academic programs such as computer programming, or specialized fields such as aviation, fashion design and so on.
- Technical and Vocational schools.

4 LANGUAGE REVIEW

4.1 Match the sentences in the Present Continuous with the correct descriptions.

1	They are leaving for Manchester tomorrow morning.	**a**	actions happening around the moment of speaking
2	He is looking for a better job now.	**b**	actions happening at the moment of speaking
3	She is looking through the mail at the moment.	**c**	repeated actions with 'always' expressing annoyance or criticism
4	She is always interrupting me.	**d**	temporary situations
5	She is living in a hotel until she rents a flat.	**e**	changing or developing situations
6	It is getting more and more difficult to find a well-paid job.	**f**	fixed arrangements in the near future

4.2 Put the verbs in brackets in the Present Simple or the Present Continuous. Reproduce the dialogues in pairs.

A

Ann: Hi, Mum!

Mum: Hallo, Ann! Where **(1)** _____ (***you/call***) from?

Ann: I **(2)**_____ (***be***) at work at the moment. My boss **(3)** _____ (***have***) a meeting with our permanent clients now. He often **(4)** _____ (***arrange***) business meetings with clients on Tuesdays.

Mum: What about your college study?

Ann: I **(5)** _____ (***do***) fine. Currently I **(6)** _____ (***prepare***) a course project in Electromagnetic Fields.

Mum: Well, why **(7)** _____ (***you/phone***)? Is there anything wrong?

Ann: No, I just want you to know that I **(8)** _____ (***come***) home next Saturday.

Mum: What time **(9)** _____ (***your train/arrive***) in Leeds?

Ann: It **(10)** _____ (***leave***) London at 12 o'clock and **(11)** _____ (***arrive***) in Leeds at 3 o'clock.

Mum: See you on Saturday then.

B

John: **(1)** _____ (***you/look***) for someone?

Lucy: Yes, I **(2)** _____ (***need***) to speak to Bryan Smith but he isn't in his office. **(3)** _____ (***you/know***) where he is?

John: Oh, I'm sorry, he isn't here today. He **(4)** _____ (***visit***) our plant. He **(5)** _____ (***try***) to prepare a report on our occupational safety standards. I **(6)** _____ (***think***) he'll be back at his desk tomorrow. Perhaps I can help you?

Lucy: Oh, thanks. I **(7)** _____ (***work***) for BHW Ceramics. We **(8)** _____ (***supply***) electrical ceramic insulators to the transmission, distribution and railway industries.

John: Oh, yes.

Lucy: Well,Bryan Smith contacted us last week. You **(9)** _____ (***want***) to place the order.

John: Yes, that's right.

Lucy: We **(10)** _____ (***help***) businesses with all aspects of design for their requirements and **(11)** _____ (***guarantee***) short delivery times.

Bryan asked me to call in and give all the details on our products. I **(12)** _____(***have***) all our catalogues and pricelists with me.

John: Well, that sounds great. I'm sure Bryan would be really interested tosee everything.

Lucy: Could you look through the catalogues and prepare the papers to place the order?

John: Oh, I'm sorry, I **(13)** _____(***not/know***) exactly. You really need to speak to Bryan, he **(14)** _____(***deal***) with this order. I'll tell him to give you a ring tomorrow. What's the best time to call?

Lucy: I **(15)** _____ (***meet***) a client tomorrow morning … anytime after three. He can call me on my mobile. He **(16)** _____ (***have***) my phone number.

4.3 Choose the correct tense form of the state verbs.

1 I ***see/am seeing*** that the situation is out of control.
2 They can't talk to you, they ***see/are seeing*** their permanent clients.
3 Our Project Manager is Italian. He ***comes/is coming*** from Italy.
4 The representative of a consulting engineering firm ***comes/is coming*** tomorrow.
5 She ***is /is being*** very intolerant and nervous these days, because we can't cope with the urgent order.
6 You haven't said a word all morning. What ***are you thinking/do you think***about?
7 I ***think/am thinking*** changes are inevitable.
8 They ***weigh/are weighing*** the cargo that has just been delivered.
9 The cargo is heavy. It ***weighs/is weighing***a lot.
10 This uniform ***fits/is fitting*** me perfectly.
11 We ***fit/are fitting*** a new carpet in the hall.
12 They ***appear/are appearing*** to be working.
13 The new General Manager ***appears/is appearing*** in the office tonight.
14 The coffee ***tastes/is tasting*** really bitter.
15 They ***taste/are tasting*** our new brand of coffee.
16 She ***has/is having*** a lot of responsibilities as the chief of the department.
17 ***Are you having/Do you have*** a good time at the moment?

4.4 Use the definite article where necessary.

1 Have you ever gone skiing in _____ Alps?
2 Is _____ Everest the highest mountain in the world?
3 What is the capital of _____ Netherlands?
4 He graduated from _____ Yale University in 1997.
5 The house over there belongs to _____ Browns. They moved in last month.
6 _____ Nile is the second-longest river in the world.
7 When _____ UN was founded in 1945, it had 51 member states.
8 Europe, Asia, Africa, and Australia are in _____ Eastern Hemisphere.
9 _____ NATO was established in 1949.
10 Bunin was the first Russian to receive _____ Nobel Prize in Literature in 1933.
11 _____ Lake Baikal is the deepest freshwater lake in the world.
12 _____ Mont Blanc is the highest peak in _____ Alps.
13 _____ Westminster Abbey is near _____ Parliament Square - at the top end of _____ Victoria Street.
14 The delegation arrived at _____ Heathrow Airport yesterday.
15 _____ Hyde Park is very famous all over _____ world.
16 _____ Odeon Cinema is in _____ Green Street.
17 _____ Trafalgar Square is in _____ London.

5 SKILLS

WRITING A FORMAL EMAIL

You would like to take an Electrical Engineering course in the UK. You have surfed the Internet looking for options. Write a formal email to the authorities of the University of Dundee requesting the information about the course you are going to take: the mode, the price, the start date, duration, venue, students accommodation, etc. Use the information given on the university site.

The University of Dundee is one of the UK's leading universities, internationally recognised for its expertise across a range of disciplines including science, medicine, engineering and art. An established university, it has a progressive and dynamic outlook, constantly striving to build on its achievements: investing in excellent facilities, pushing the boundaries of research, and developing new ways of e-learning.

Electronic and Electrical Engineering
Department of Electronic Engineering and Physics

Course description:

Year 1: Engineering mathematics; information technology; electricity optics and waves; mechanics and thermodynamics; electrical/electronic engineering project.

Year 2: Engineering mathematics; engineering design and communications; engineering software; analogue and digital electronic systems; electrical and mechanical systems; fundamentals of electronic devices.

Year 3: Analogue electronic circuits; digital electronic circuits; microelectronics; telecommunications; mathematical methods; computer engineering; electronic control; electrical power; communication skills.

Qualification: Undergraduate in Electronic and Electrical Engineering

UNIT 4

1 LEAD-IN

1 What engineering institutions are there in Ukraine?

2 What status do engineering jobs have in Ukraine?

3 What qualifications do people need to work as electrical engineers?

4 Why did you choose the profession of an electrical engineer?

5 What do you know about job vacancies in the electrical engineering field?

6 Is your future profession rewarding? What do you like about it?

7 What are the biggest challenges in the job of an electrical engineer?

8 Is this profession in demand abroad?

9 Do you have some chance to get an international experience and work for some engineering company abroad when you graduate from the university? Can Ukrainian students apply for the scholarship granted by a foreign country?Do you know about any government scholarship progamme for Ukrainian graduates?

10 Put the notes on the good things about the profession of an electrical engineer in the order from the most preferable to the least preferable.

- possibility to work for respected companies
- job security
- excellent salary
- job that can take abroad
- possibility to be involved in international projects
- having a lot of freedom at work
- ability to do research
- no overtime work

2 READING

2.1 Read the text about the engineering profession. Choose the best sentence (A–B) to fill each of the gaps (1–4).

A Everything people use today has been designed and developed or manufactured by one or more engineers.

B These are research engineering and constructive or creative engineering.

C The evolution must continue and change is needed to address the needs of the 21st century.

D In the simpler terms, an engineer is a convergent thinker who uses the rules of mathematics and takes basic science information to solve problems and manufacture new products.

E The intense discussions that are currently taking place among leaders of the profession and educators suggest that innovation will be a central theme.

F And there are also other fields where more and more people are entering.

TEXT A
THE ENGINEERING PROFESSION

The engineering profession in some of its branches is one of the oldest recorded in history. An engineer is the person who implements scientific principles to bring theories to ground realities. He or she is proficient in mathematics and other sciences and continuously strives to discover, study new technologies to introduce advanced and innovative products or services for consumers. **(1)_____**.

There are two broad divisions of engineering which cover practically all forms of engineering activity. **(2)_____**. In the former division are included the work of the scientist, the work of the investigator and the work of the inventor; in the latter the work of those whose task is to assemble the knowledge gained in research and to use this knowledge in the creation of things of value to all the people.

Engineers influence different aspects of modern life, and it is likely that today you rely on the expertise of an engineer or engineers. **(3) _____**.

There are various types of engineers. The major areas where engineers specialize are mechanical, electrical, aerospace, marine, and civil engineering. **(4) _____**. These include software, electronics, nuclear, biomedical engineering, etc. Electrical engineering is a field of engineering that generally deals with the study and application of electricity, electronics and electromagnetism. The field first became an identifiable occupation in the late nineteenth century after commercialization of the electric telegraph and electrical power supply. It now covers a range of subtopics including power, electronics, control systems, signal processing and telecommunications. Electrical engineers are responsible for developing electrical systems that may be consumer based (like MP3 players, iPods, digital cameras, DVD players, etc.), as well as power-based like

airline navigation system or the electricity grids in cities. An electrical engineer has many options to go for in specialization, from computer networks and robotics to wireless communications and even medical imaging.

An engineering education has changed to adjust to the needs of society. **(5) _____**. The major trends in engineering education can be summarized by the following classification:

- 19thcentury and the first half of the 20th century – professional engineer;
- second half of the 20th century – scientific engineer;
- the 21st century – entrepreneurial/enterprising engineer.

It cannot be said definitely what the engineering profession will look like hundred years from now. **(6) _____**. It is evident that the entrepreneurial engineer of the twenty-first century

- knows everything — can find information about anything quickly and knows how to evaluate and use the information,
- can do anything — understands the engineering basics to the degree that he or she can quickly assess what needs to be done, can acquire the tools needed, and can use these tools proficiently,
- works with anybody anywhere — has the communication skills, team skills, and understanding of global and current issues necessary to work effectively with other people,
- imagines and can make the imagination a reality — has the entrepreneurial spirit, the imagination, and the managerial skills to identify needs, come up with new solutions, and see them through.

It is unthinkable that society can remain competitive and can sustain the present standard of living without a large number of people with the knowledge and know-how to innovate. It needs to educate engineers that understand the societal context of their work, have an understanding of the human dimension around the globe, coupled with innovation and creativity.

2.2Answer the following questions to the text.

1 What is the major role of an engineer?

2 What knowledge must an engineer have to perform his or her professional duties effectively?

3 What are the divisions of engineering? What does each of the divisions comprise?

4 What are the major areas the engineers specialize in?

5 What does electrical engineering deal with?

6 What periods in engineering education can be distinguished according to the character of the professional demands?

7 What are the challenges of an engineer of the twenty-first century?

TEXT B
GETTING THE ELECTRICAL ENGINEERING PROFESSION ABROAD

(1) Electrical engineering is a field of engineering that generally deals with the study and application of electricity, electronics and electromagnetism. Electrical engineering may include electronic engineering. Where a distinction is made, usually outside of the United States, electrical engineering is considered to deal with the problems associated with large-scale electrical systems such as power transmission and motor control, whereas electronic engineering deals with the study of small-scale electronic systems including computers and integrated circuits. Alternatively, electrical engineers are usually concerned with using electricity to transmit energy, while electronic engineers are concerned with using electricity to process information.

(2) Electrical engineers typically possess an academic degree with a major in electrical engineering. The length of study for such a degree is usually four or five years and the completed degree may be designated as a Bachelor of Engineering, Bachelor of Science, Bachelor of Technology or Bachelor of Applied Science depending upon the university. The degree generally includes such disciplines as physics, mathematics, computer science, project management and specific topics in electrical engineering. Initially such topics cover most, if not all, of the sub-disciplines of electrical engineering. Students then choose to specialize in one or more sub-disciplines towards the end of the degree. Some electrical engineers also choose to pursue a postgraduate degree such as a Master of Engineering/Master of Science (M.Eng./M.Sc.), a Master of Engineering Management, a Doctor of Philosophy (Ph.D.) in Engineering, an Engineering Doctorate (Eng.D.), or an Engineer's degree. The Master and Engineer's degree may consist of either research, coursework or a mixture of

the two. The Doctor of Philosophy and Engineering Doctorate degrees consist of a significant research component and are often viewed as the entry point to academia. In the United Kingdom and various other European countries, the Master of Engineering is often considered to be an undergraduate degree of slightly longer duration than the Bachelor of Engineering.

(3) From the Global Positioning System to electric power generation, electrical engineers have contributed to the development of a wide range of technologies. They design, develop, test and supervise the deployment of electrical systems and electronic devices. For example, they may work on the design of telecommunication systems, the operation of electric power stations, the lighting and wiring of buildings, the design of household appliances or the electrical control of industrial machinery.

(4) Fundamental to the discipline are the sciences of physics and mathematics as these help to obtain both a qualitative and quantitative description of how such systems will work. Today most engineering work involves the use of computers and it is commonplace to use computer-aided design programs when designing electrical systems. Nevertheless, the ability to sketch ideas is still invaluable for quickly communicating with others.

(5) Although most electrical engineers will understand basic circuit theory (that is the interactions of elements such as resistors, capacitors, diodes, transistors and inductors in a circuit), the theories employed by engineers generally depend upon the work they do. Perhaps the most important technical skills for electrical engineers are reflected in university programs, which emphasize strong numerical skills, computer literacy and the ability to understand the technical language and concepts that relate to electrical engineering.

(6) For many engineers, technical work accounts for only a fraction of the work they do. A lot of time may also be spent on tasks such as discussing proposals with clients, preparing budgets and determining project schedules. Many senior engineers manage a team of technicians or other engineers and for this reason project management skills are important. Most engineering projects involve some form of documentation and strong written communication skills are therefore very important.

2.1 Skim the text and decide which paragraph

1 __ mentions the most important technical skills of an electrical engineer.

2 __ distinguishes the fields of electrical engineering and electronic engineering.

3 __ pointstothe necessity ofbeing a good communicator to perform the tasks successfully.

4 __ gives the information about the academic degrees that can beobtained by an electrical engineer.

5 __ defines the main fields of activities electrical engineers can be involved in.

6 __ indicates the fundamental disciplines for the electrical engineer' background.

7 __ emphasizes the importance of havingthe sound knowledge of modern computer programmes.

2.2 Answer the following questions to the text.

1 Does electrical engineering distinguish from the field of electronic engineering in most countries abroad?

2 What degree is typically obtained by electrical engineers?

3 What is the duration of study for such a degree?

4 What does obtainingan academic degree in electrical engineering imply?

5 What other degrees can be designated in case of pursuing a postgraduate degree?

6 What are the most important technical skillsof electrical engineers?

7 What other skills do electrical engineers have to gain to provide effective team work as well as successful communication with clients?

3 VOCABULARY

3. 1 A.Match the following words in (1–8) and (a–h) from Text 1 to make up word partnerships. Use them in the sentences of your own.

1	to implement	**a**	for customers
2	to introduce products	**b**	scientific principles
3	to bring theories	**c**	of engineering activity
4	to cover all forms	**d**	to ground realities
5	to use the knowledge	**e**	of modern life
6	to influence different aspects	**f**	in the creation of things

7	to adjust	**g**	the present standards of living
8	to sustain	**h**	to the needs of society

B.Match the following words in (1–5) and (a–b) from Text 2 to make up word partnerships. Use them in the sentences of your own.

1	a field	**a**	of electrical systems
2	the deployment	**b**	of engineering
3	the application	**c**	of technologies
4	the study	**d**	of electricity
5	the development	**e**	of electronic systems

3.2 Fill in the missing word forms as in the examples. Use a dictionary if necessary.

verb	***noun***	***person***
create	creation	creat***or***
design	design	design***er***
construct	_____	_____
develop	_____	_____
evaluate	_____	_____
innovate	_____	_____
manage	_____	_____
navigate	_____	_____
occupy	_____	_____
supply	_____	_____

3.3 Which word? Make up and remember the wordpartnerships that are frequently used with the following nouns.

electric ~	**electrical ~**
light	equipment
guitar	wring
drill	signal
chair	engineer
shock	shock
field	machine
company	engine
charge	engineering

The word **electric** is usually used to describe something that uses or produces electricity.

You use **electrical** with more general nouns such as ***equipment*** and ***wiring***and thing that are concerned with electricity: ***an electrical fault***. However, the distinction is not always so clear now: ***an electric/electrical company; an electric/electrical current; an electric/electrical shock.***

3.4 Which word or expression from the text can be used to mean the following:

1	a source of power, such as fuel, used for driving machines, providing heat, etc.	**a**	energise
2	to supply power or energy to a machine, an atom, etc.	**b**	energy
3	the activity of applying scientific knowledge to the design, building and control of machines, roads, bridges, etc.	**c**	engineer
4	a person whose job involves designing and building engines, machines, roads, bridges, etc.	**d**	engineering
5	connected with electricity; using or producing electricity	**e**	electrician
6	a person whose job is to connect, repair, etc. electrical equipment	**f**	electric(al)
7	a form of energy from charged elementary particles	**g**	electrical engineering
8	the design and building of machines and systems that are used or produce electricity	**h**	electricity

3.5 Choose the right words to fit into the following paragraph.

careers	***electricity***	***team***	***products***	***schedules***
reality	***demand***	***needs***	***in charge***	***appliances***

The world today would not be able to function without **(1)** _____ , so the **(2)** _____ for electrical engineers is constantly on the rise.

Electrical engineers are **(3)** _____ of designing and developing electrical systems and **(4)** _____ . The products and systems they work on are incredibly varied, and be as large scale as huge factories down to household goods and **(5)** _____ . Like all areas of engineering, their job essentially involves turning

ideas into **(6)** _____ .

Electrical engineers works with transformers, circuits, electrical parts and wiring to create products that rely on electricity to function. They are often given project specifications from their employees they have to work for, usually in a **(7)** _____ with other engineers and related people.

They have many roles within projects, including creators, planners, designers and managers. They are involved in projects from start to finish and oversee every part of the process. Some of the processes that electrical engineers may be involved in include: anticipating and identifying customers **(8)** _____ and translating them into design specifications; building prototypes; identifying and monitoring milestones along the projects development; supervising construction plans; designing and drawing electrical systems; selecting appropriate materials; and developing maintenance **(9)** _____ . They are kept very busy and have a great diversity in their **(10)** _____ .

4LANGUAGE REVIEW

4.1 Put each of the verbs in brackets into the Past Simple.

One of the most famous inventors of all time, Thomas Alva Edison **(1)** _____ (***exert***) a tremendous influence on modern life, **(2)** _____ (***contribute***) inventions such as the incandescent light bulb, the phonograph, and the motion picture camera, as well as **(3)** _____ (***improve***) the telegraph and telephone. In his 84 years, he (**4**) _____ (***acquire***) an astounding 1,093 patents. Aside from being an inventor, Edison also **(5)** _____ (***manage***) to become a successful manufacturer and businessman.

Thomas Alva Edison **(6)** _____ (***be***) born to Sam Edison and Nancy Elliott on February 11, 1847, in Milan, Ohio. Edison **(7)** _____ (***be***) the youngest of seven children, four of whom **(8)** _____ (***survive***) to adulthood. To seek a better fortune, Sam Edison **(9)** _____ (***move***) the family to Port Huron, Michigan, in 1854, where he **(10)** _____ (***work***) in the lumber business.

Edison **(11)** _____(***be***) a poor student. When a schoolmaster **(12)** _____ (***call***) Edison "addled," his furious mother **(13)** _____ (***take***) him out of the school and **(14)** _____ (***proceed***) to teach him at home. Edison **(15)** _____ (***say***) many years later, ‘My mother **(16)** _____ (***be***) the making of me. She **(17)** _____ (***be***) so true, so sure of me, and I **(18)** _____ (***feel***) I **(19)** _____ (***have***) someone to live for.’ At an early age, he **(20)** _____ (***show***) a fascination for mechanical things and for chemical experiments.

In 1859, Edison **(21)** _____ (***take***) a job selling newspapers and candy on the Grand Trunk Railroad to Detroit. In the baggage car, he **(22)** _____ (***set up***) a laboratory for his chemistry experiments and a printing press. An accidental fire **(23)** _____ (***force***) him to stop his experiments on board. Around the age of twelve, Edison **(24)** _____ (***lose***) almost all his hearing. He **(25)** _____ (***notlet***) his disability discourage him, however, and often **(26)** _____ (***treat***) it as an asset, since it **(27)** _____ (***make***) it easier for him to concentrate on his experiments and research.

4.2 Choose the correct option.

1 I was sure that I _____the door to my office last night.

a used to lock **b** locked **c** was used to locking

2 Our company _____ to belong to a French multinational.

a used **b** used to **c** got used

3 'Do you like working in this department?'
'Well, I _____ to it yet, but it's okay.'

a am not used **b** wasn't used **c** am used

4 I _____ on the left because I've lived in Britain for a long time.

a used to drive **b** am getting used to driving **c** am used to driving

5 I ____ to work every day, but these days I usually get to my office by bus.

a am used to driving **b** used to drive **c** got used to driving

6 I wouldn't like to share an office. I _____ in my own office.

a am used to working **b** am getting used to working **c** am used to work

7 I _____ a lot on business, but nowadays I have to.

a used to travel **b** didn't use to travel **c** was used to travelling

4.3 Read the following sentences correctly.

1 On April 24, 1877 Charles F. Brush issued U.S. Patent No. 189,997 for his arc lighting system.

2 Although a flashlight is a relatively simple device, its invention did not occur until the late 19th century because it depended upon the earlier invention of the electric battery and electric light bulb.

3 Some special services have their own short numbers (e.g.1-1-9, 9-1-1, 0-0-0, 9-9-9, 1-1-1, and 1-1-2 being the Emergency Services numbers for China, Japan, South Korea, Taiwan and Sri Lanka; Canada and the United States; Australia; the United Kingdom; New Zealand; and the European Union, respectively.)

4 I'm afraid I can't come. I have another meeting scheduled for 2:30 p.m.

5 About 3/5 of workers are young people.

6 The meeting started at 8:30 a.m. in Room 202.

7 The stock deal, which involved $4.5 billion, paid a 12.5% dividend.

8 The vote was 126 in favour of the action and only 16 opposed.

9 The assignment was to read chapter 6, pages 31-39.

10 Take bus 5 to get to the park.

11 The meeting is scheduled for the 30th of June.

12 The Bulls won the final game by a score of 114 to 106.

13 She has been living in this city for almost 11 years.

14 During the 1980s she lived in San Francisco.

5 SKILLS.

DISCUSSION

5.1 Read the following top ten qualities of an engineer and discuss with your partner which of them are of special demand for a successful electrical engineer. Interview each other and clarify what qualities your partnerhas to start acareer in Electrical Engineering.

Top 10 Qualities of an Engineer

- **Strong Analytical Aptitude**

A great engineer has excellent analytical skills and is continually examining things and thinking of ways to help things work better. They are naturally inquisitive.

- **Shows an Attention to Detail**

A great engineer pays meticulous attention to detail. The slightest error can cause an entire structure to fail, so every detail must be reviewed thoroughly during the course of completing a project.

- **Has Excellent Communication Skills**

A great engineer has great communication skills. They can translate complex technical lingo into plain English and also communicate verbally with clients and other engineers working together on a project.

- **Takes Part in Continuing Education**

A great engineer stays on top of developments in the industry. Changes in technology happen rapidly, and the most successful engineers keep abreast of new research and ideas.

- **Is Creative**

A great engineer is creative and can think of new and innovative ways to develop new systems and make existing things work more efficiently.

- **Shows an Ability to Think Logically**

A great engineer has top-notch logical skills. They are able to make sense of complex systems and understand how things work and how problems arise.

- **Is Mathematically Inclined**

A great engineer has excellent math skills.Engineering is an intricate science that involves complex calculations of varying difficulty.

- **Has Good Problem Solving Skills**

A great engineer has sharp problem solving skills. An engineer is frequently called upon solely to address problems, and they must be able to figure out where the problem stems from and quickly develop a solution.

- **Is a Team Player**

A great engineer understands that they are part of a larger team working together to make one project come together successfully, and therefore, must work well as part of that team.

- **Has Excellent Technical Knowledge**

A great engineer has a vast amount of technical knowledge. They understand a variety of computer programmes and other systems that are commonly used during an engineering project.

5.2 Read the following engineering jokes. Do you know any other jokes?

- *Arguing with an Engineer is a lot like wrestling in the mud with a pig. After a few hours, you realize that he likes it.*
- How many Engineering Directors does it take to change a light bulb?
  Just one. He holds the light bulb still and expects the world to revolve around him.
- How many first year engineering students does it take to change a light bulb?
  None. That's a second year subject.

- How many second year engineering students does it take to change a light bulb?
  One, but the rest of the class copies the report.
- How many third year engineering students does it take to change a light bulb?
  "Will this question be on the final exam?"
- How many civil engineers does it take to change a light bulb?
  Two. One to do it and one to steady the chandelier.
- How many electrical engineers does it take to change a light bulb?
  None. They simply redefine darkness as the industry standard.
- How many computer engineers does it take to change a light bulb?
  "Why bother? The socket will be obsolete in six months anyway."
- How many mechanical engineers does it take to change a light bulb?
  Five. One to decide which way the bulb ought to turn, one to calculate the force required, one to design a tool with which to turn the bulb, one to design a comfortable-but functional- hand grip, and one to use all this equipment
- How many nuclear engineers does it take to change a light bulb?
  Seven. One to install the new bulb and six to figure out what to do with the old one for.

UNIT 5

1 LEAD-IN

1 What is the role of computer skills in the career development?

2 Do all students have necessary computer literacy skills?

3 We are used to speaking about a user-friendly computer. What does it mean?

4 How do you use a computer to help yourself withlearning?

5 Do you often/sometimes/never do the following things? Why?/Why not?

- do exercises on CD-Rom
- surf the Internet to find professional information
- watch English-speaking films or TV programmes
- listen to songs in English
- email people in English
- access English websites or take part in online chats and webinars in English
- listen to the English radio
- type up reports or course projects using a computer
- prepare presentations

2 READING

2.1 The text below is divided into six sections. Skim the text and match each heading to the most suitable paragraph.

1 Electronic Learning

2 The Foreseeable Future of the Computer Usage

3 The Internet as a Powerful Means of Interaction

4 Computers in the Era of Powerful Information Flow

5 Computers in Everyday Life

6 Modern Demand for Computer Literacy

THE NEED FOR COMPUTER LITERACY IN MODERN SOCIETY

A _____

An outstanding characteristic of modern society is the powerful flow of knowledge and information in different fields of human activities. Information is often called the lifeblood of modern civilization. It plays an ever increasing part in everyday life, management of business, etc. The present-day information explosion must be properly dealt with. To handle

the information flow properly and instantly, to help specialists find information and data immediately a multiple of machines have been invented. Computers have fundamentally altered the way we live and work. They have, in particular, transformed our ability to deal with information and data. We are now moving rapidly toward where we can process information infinitely fast, store infinite amount of data, and transmit data instantaneously. Computers have also empowered the average person to create products that previously required large corporations with significant resources. They are ideal for high-volume computing tasks such as the computation and analysis of statistical and mathematical data as well as scientific and engineering calculations.

B_____

Computers have become the part of our everyday lives. They have an effect

on almost everything you do. When you buy groceries at a supermarket, a computer is used with laser and barcode technology to scan the price of each item and present a total. Barcoding items (clothes, food and books) require a computer to generate the barcode labels and maintain the inventory. Most television advertisements and many films use graphics produced by a computer. In hospitals, beside terminals connected to the hospital's main equipment, computers allow doctors to type in orders for blood tests and to schedule operations. Banks use computers to look after their customers' money. In libraries and bookshops, computers can help you to find the book you want as quickly as possible.

C _____

The Internet has revolutionized the computer and communication world like no other thing before. The Internet is at once a worldwide broadcasting capability, a mechanism for the information dissemination, and a mediumfor the collaboration and interaction between individuals and their computers without regard for geographic location. As a result of the emergence of the Internet, knowledge has become the common possession. Everybody has access to any information and knowledge is no longer 'owned' by the experts.

D _____

Electronic Learning or e-Learning is reinventing the way people learn. The desk, the chalkboard, the paper and pencil, and the knowledge-giver no longer dominate the classroom. The Internet is the biggest influence. When delivered via the Internet, the vendors' curricula can personalize learning. Any student can use a computer as a medium through which the access to information and resources becomes obtainable.

E _____

The computer field continues to experience a huge growth. Computer networking, computer mail, and electronic publishing are just a few of the applications that have grown in recent years. Advances in technologies continue to produce cheaper and more powerful computers offering the promise that in the near future, computers or terminals will reside in most, if not all homes, offices, and schools.

F _____

Therefore, the pressure on those who still are unfamiliar with computers and their use is ever greater. So, almost everyone will need to become familiar with data processing and computing to a greater or lesser extent. No matter whether we need it in the home, office, school, college or factory, it will be almost as commonplace to use a computer as it is to drive a car. It is absolutely necessary for every active member of a modern society to be able to use the computer system in data or information processing and management.

2.2 Answer the following questions to the text.

1 What is the most outstanding characteristic of a modern society?

2 What helps people cope with the information explosion and handle the information flow?

3 Why have computers fundamentally altered the way we live and work?

4 How have computers changed our daily lives?

5 What is the result of the Internet emergence?

6 In what way has the process of computerization changed the system of education?

7 Why can we say that the knowledge delivered via the Internet personalizes learning?

8 What are the most common applications of a computer?

9 Is the computer literacy becoming a necessity?

3 VOCABULARY

3.1 Match the left and the right sides to make up word partnerships.

1	characteristic	**a**	of data
2	management	**b**	of modern society
3	infinite amount	**c**	of business
4	the emergence	**d**	of statistical data
5	analysis	**e**	to information and resources
6	part	**f**	of the Internet
7	mechanism	**g**	of our everyday lives
8	access	**h**	for information dissemination

3.2 Fill in the missing word forms. Use a dictionary if necessary.

verb	*noun*	*adjective*	*adverb*
effect	_____	_____	_____
experiment	_____	_____	_____
equalize	_____	_____	_____
help	_____	_____	_____
personalize	_____	_____	_____
practise	_____	_____	_____
specialize	_____	_____	_____

3.3 Match the wordsin italics with the nouns (1–5) to make up word partnerships. Use them in the sentences (1-5) given below.

human huge practical significant engineering

1 _____ activities
2 _____ equipment
3 _____ growth
4 _____ purposes
5 _____ resources

1 He isn’t a licenced mechanic, but he is good for all p _____ p _____ .
2 S_____ r_____ are those that are likely to have a material bearing on the decision-making process.
3 The company has over 30 years of experience in the construction of power e _____ e _____ .
4 Google chart shows a h _____ g _____ in many Android devices use.

5 H_____ a_____ have led to increased atmospheric concentrations of a number of greenhouse gases, including carbon dioxide, methane, nitrous oxide, chlorofluorocarbons, and ozone in the lower part of the atmosphere.

3.4 You have come across ~~the text~~ the following compound adjectives in the text in 2.1:

present-day high-volume world-wide

A. Think of and make up some other compound adjectives using the following words.

1	top	**a**	called
2	so	**b**	secret
3	part	**c**	made
4	hand	**d**	time
5	full	**e**	controlled
6	remote	**f**	time
7	word	**g**	peak
8	off	**h**	famous

B. Match the compound adjectives from A with the nouns in (a-h) as in the example: *last-minute arrival*

1	_____	**a**	calls
2	_____	**b**	scientist
3	_____	**c**	TV
4	_____	**d**	employment
5	_____	**e**	information
6	_____	**f**	expert
7	_____	**g**	job
8	_____	**h**	thing

3.5 Choose the right words to fit into the following paragraph.

work	***countries***	***people***	***Computer***	***their***	***important***
workers	***skills***	***literacy***	***companies***	***operates***	***knowledge***

Why Is Computer Literacy Important?

Computer literacy refers to having the skills and the **(1)** _____to use computers competently. **(2)** _____ literacy also implies that one is

comfortable with using computer software and other applications that relate to the computer. Another **(3)** _____ part of being computer literate is to know how the computer functions and **(4)** _____. Basic computer skills are considered to be very important assets of people in developed **(5)** _____.

First world and developing countries consider computer **(6)** _____ to be a very vital skill to acquire. Employers desire their **(7)** _____ have basic computer skills because **(8)** _____ companies are becoming more technologically advanced. The computers help them to run their **(9)** _____ efficiently and cost effectively.

With the influence and essentiality of becoming computer literate individuals, **(10)** _____ now regard that living without computer **(11)** _____ would now be unimaginable. People rely much on computers on the amount of **(12)** _____ they can accomplish**.**

4 LANGUAGE REVIEW

4.1 Complete the sentences by putting the verbs in brackets into either the Past Simple or Past Continuous.

1 She _____ (***try***) to explain her proposal, when the supervisor _____(***interrupt***) her.

2 When he _____ (***finish***) reading the manual, he _____ (***give***) it to me.

3 Everyone _____ (***wait***) for the meeting to begin when the manager _____ (***call***) to say that he was stuck in the traffic jam.

4 When the electrician _____ (***arrive***), we _____ (***explain***) him what had happened.

5 What _____ (***you/do***) when the industrial accident happened?

6 We _____ (***look through***) the report when the lights went out.

7 Yesterday morning John _____ (***read***) the design specifications and technical drawings while Mike_____ (***estimate***) the costs of the project.

8 When he _____ (***join***) the company five years ago, he _____ (***be***) responsible for supervising the manufacture of electrical equipment.

9 They _____ (***type***) the report with the results of the experiment when the system _____ (***fail***).

10 The electric energy industry in the US _____ (***be***) under a restructuring driven by changes in federal and state laws in the 1990s.

4.2 Underline the correct verb forms.

1 A: What was he doing this morning?

B: He ***calculated/was calculating*** the project expenditures to avoid cost overruns.

2 A: How did David spend his weekend?

B: He ***was going/went*** to Paris on business.

3 A: I didn't see you in the office last week.

B: I ***worked/was working*** at home trying to present the results of our experiment.

4 A: What did they do when the electric transmission lines were damaged?

B: They immediately ***got in touch***/***were getting*** in touch with the utility company.

5 A: What were you doing when we were discussing what caused the power system outage?

B: I ***tried/was trying*** to find the solution.

5 SKILLS

DEBATES

Over the past years, computer technology has started to change many aspects of our life. One of them is the approach to teaching and learning. Many people believe that the Internet will greatly enhance students' lives but the others think that costs will outweigh the benefits.

Speculate about the problem in small groups using the prompt ideas given below. Support your opinion with the examples from your personal experience. Give the ideas of how to use the positive sides in the most effective ways and how to reduce the negative ones.

PROS	*CONS*
• ***convenience*** (Computer technology has made life much easier and convenient. One of the biggest conveniences is how many tasks and/or needs that formerly required trips to be made can now be accomplished from the comforts of home.)	• ***disadvantages to students health*** (Most activities can be done right from the comforts of a chair or other stationary position, students are moving less. Long hours at the computer can negatively influence students' sight.)

- ***saves time***
  (Computer technology has the capabilities to take over the mundane chores that are time consuming.)

- ***fast and efficient***
  (Things can be adjusted, fixed or taken care of on a moment's notice as long as a secure Internet connection is available.)

- ***communication***
  (No longer are time zones, physical distance or long distance expenses barriers to maintaining contact with family, friends and colleagues. With communication tools such as e-mail, instant messaging, Skype, chat and video conferencing, there are many different choices available to keep people connected and in touch, often at very little cost.)

- ***a valuable source of information and the best means of transmitting this information***

- ***restrict the opportunity to meet and socialize with other students***
  (Students communicate chatting on the Internet, staying at home.)

- ***plagiarism***
  (Sometimes students use ideas of other people and present them as their own ones.)

- ***the level of lecturer/student contact that students and lecturers are used to may be reduced***
  (University lecturers are now able to put their lectures on the Internet for students to read and so the importance of attending face to face lectures has been reduced.)

- ***lecturers may be less available for consultation***
  (If the lecturers are able to put their Lectures on the Internet, they may choose to do this from home and so be less available for consultation.)

UNIT6

1 LEAD-IN

1 Can we consider Ukraine to be an energy-rich country?

2 Is there a balance between the domestic primary energy supply and demand in Ukraine?

3 Do you know what the one-third of Ukraine's primary energy is sourced from?

4 What kind of power plays the most significant rolein the country's economy?

5 What alternative sources of energy are needed to start a realistic clean energy programme in Ukraine for future generations?

2 READING

2.1 Scan the text and choose the best headline for the text

1 Economic Regions of Ukraine As the Components of a Major European Economy

2 Current Energy Efficiency Status of National Economy

3 The Reputation of Ukraine's 'Business Climate'

4 Energy Saving Potential in Ukraine

Large energy content in Ukraine's GDP is the result of a significant technological lag in the majority of economy sectors compared to the developed countries, unsatisfactory structure of national economy, negative impact of the shadow sector, specifically, import or export operations, which objectively limit the competitive power of national production. It is burdensome for the economy, especially concerning its foreign energy dependence. In contrast to the industrially developed countries where energy saving is an element of economic and environmental expediency, in case of Ukraine it is an issue of survival under the market conditions and the entry into the European and world market. This requires addressing the problem of well-balanced solvent demand both to the internal and external markets, as well as to the diversification of fuel and energy imports.

Low energy efficiency has become one of the key factors that have given rise to critical situations in Ukraine's economy. The energy component in the cost structure of manufactured goods had an almost three-fold increase in the first half of 1990s, reaching 42% of total material expenses regarding the output of products. It was not until 1997-1999 that energy efficiency of the economy began to improve as the result of measures taken at the state level. While the GDP energy content grew by 38.6% in 1990-1996, it had been decreasing significantly since 2000, and it was for the first time in the Ukraine's history that GDP grew simultaneously with the reduction in the consumption of primary fuel and energy resources.

However, it should be noted that the GDP energy content reduction rates slowed down in 2002 due to negative changes in the energy content reduction trend with regard to the gross value added in the most energy-intensive sectors of the economy – metallurgy, machine building, chemical and petrochemical, as well as in the housing and communal services sector. These changes were brought about by a high depreciation (65-70%) of fixed assets and the corresponding increase in per unit cost of fuel and energy resources for a number of important product types.

Energy saving is one of the crucial factors in the energy strategy of Ukraine. It determines the effective operation of national economy. At present, building up an efficient energy-saving state regulation system is the main factor reducing the energy content of goods and services in all sectors of economy. This will make possible to improve the energy final consumption structure byreplacing critical fuels and enhancing the production efficiency.

Energy security is an integral part of economic and national security, an essential condition for the country's development. The present day concept of energy security suggests achieving the status when the economy and social sector of the state have a reliable, stable, economically efficient and environmentally safe supply of energy resources as well as creating conditions for the formulation and implementation of policy to protect national interests in the energy sector.

The main objectives with regard to ensuring Ukraine's energy security are as follows:

- to provide a reliable supply of energy resources in order to meet the needs of national economy and the population to the objectively necessary extent,

- to ensure a reliable and efficient operation and the development of sectors and companies of the Fuel-and-Energy Complex (FEC),
- to pursue a socially orientated energy policy regarding the population and FEC workers,
- to abate the detrimental impact of FEC facilities operation on the environment and the population in accordance with the internal and international requirements.

The issue of energy facilities ownership is important for the country's energy security. Nuclear power plants, hydropower plants, underground gas storage facilities, backbone and interstate power lines, oil and gas pipelines and the pipeline dispatch control must remain in the state ownership. The energy sector management and regulation should provide proper conditions and rules for the FEC facilities operation. The fair competition should be introduced at energy markets and thus the interests of the state, energy companies and the consumers of energy resources would be balanced.

2.2 Read statements 1 – 6 carefully and mark them as true (T) or false (F).

1 Ukraine has the greatest technological progress in the majority of economy sectors compared to other developed countries. ___

2 Energy saving in Ukraine is an issue of survival under the market conditions. ___

3 Production of energy in Ukraine is low effective. ___

4 The energy saving factor determines the effective operation of national economy. ___

5 The existence and development of Ukraine largely depends on its energy security. ___

6 Country’s energy security must be assured by the ownership of state energy facilities. ___

7 The interests of the state, energy companies and the consumers of energy resources would be balanced. ___

2.3 Match the sentence beginnings (1–7) to the correct endings (a–g).

1 __ Energy potential of Ukraine suffers

2 __ This problem can be solved by

3 __ Thanks to measures taken at the state level in 1997–1999

4 __ The most energy-intensive sectors of Ukraine's economy are as follows:
5 __ Energy saving in Ukraine will be provided by
6 __ Energy security of Ukraine depends on
7 __ The state ownership involves the following energy facilities:

a an efficient state energy-saving regulation system.
b nuclear power plants, hydropower plants, underground gas storage facilities, backbone and interstate power lines, oil and gas pipelines and the pipeline dispatch control.
c reliability, stability, economical efficiency and environmentally safe supply of energy resources as well as on creating conditions for the formulation and implementation of policy to protect the national interests in the energy sector.
d metallurgy, machine building, chemical and petrochemical as well as the housing and communal services sector.
e the energy efficiency of economy began to improve.
f the diversification of fuel and energy imports.
g a significant technological lag**,** an unsatisfactory structure of the national economy, and the negative impact of the shadow sector.

3 VOCABULARY

3.1 Match the following nouns from the text to make up word partnerships.

1	___	product	**a**	efficiency
2	___	market	**b**	building
3	___	reduction	**c**	sector
4	___	production	**d**	conditions
5	___	shadow	**e**	rates
6	___	machine	**f**	types

3.2 There are many word partnerships with *energy* in the text.

energy	~ companies	~ efficiency	~ resources	~ security
	~ consumer	~ import	~ saving	~ strategy
	~ content	~ market	~ sector	~ supply

Below are the examples of other word partnerships with *energy*. Fit them into the following sentences.

energy	~ user	~ consumption	~ equipment	~ requirements
		~ conservation	~ minister	~ sources
		~ economy	~ production	~ technology

1 What is the most efficient and environmentally friendly type of **e**_____ **p**_____ for home use?

2 The company produces alternative **e** _____ **e** _____ that converts energy from moving water into electricity.

3 **E**_____ **t**_____ is an interdisciplinary engineering science having to do with the efficient, safe, environmentally friendly and economical extraction, conversion, transportation, storage and use of energy.

4 **E**_____ **M**_____ Charles Hendry told Members of Parliament thatgovernments had spent £2.2 billion supporting wind power over eight years.

5 The appetite for oil and other **e** _____ **s** _____ is growing dramatically, with worldwide **e**_____ **c** _____ projected to increase by 36 percent by 2035.

6 **E**_____ **c** _____ supports the ecofriendly lifestyle by providing energy, which saves your money and at the same time saves the earth.

7 The major **e**_____ **u** _____in most buildings is the heating, ventilating, and air conditioning (HVAC) system.

8 The world **e** _____ **e** _____ has the largest influence on the decisions that people and governments make.

Can you think of some other possible word partnerships with *energy*?
Write them down and add to your vocabulary.

_____
_____
_____
_____

3.3 Choose the right words to fit into the following paragraph.

investments levels companies prices times potential

Energy Efficiency Facts

Energy intensity in Ukraine is around three **(1)** _____ higher than in the EU. This means that on average, Ukrainian **(2)** _____ use three times as much energy to produce the same output as companies in the European Union.

Needless to say, the **(3)** _____ for energy efficiency in Ukrainian companies is huge, even with today's Ukrainian energy prices, which are low compared to EU **(4)** _____. However, the market for energy efficiency investments in Ukraine is still in its infancy. But with increasing energy **(5)** _____ and WTO* accession, Ukrainian companies can only maintain their competitiveness on the world market through lowering their energy consumption by using every opportunity for profitable energy efficiency **(6)** _____.

_____

**WTO-World Trade Organization*

3.4 Fill in the appropriate adjectivesand nouns. Then make up word partnerships with the five of the words you wrote: *adjective + noun, noun + noun, noun + adjective + noun, adjective + noun + noun.*

Example: *industrial goods, energy consumption, object-oriented software, advanced market economy*

	adverb	*adjective*	*noun*
1	competitively	_____	_____
2	crucially	_____	_____
3	economically	_____	_____
4	efficiently	_____	_____
5	energetically	_____	_____
6	environmentally	_____	_____
7	inadmissibly	_____	_____
8	industrially	_____	_____
9	objectively	_____	_____
10	specifically	_____	_____

3.5 Translate the following attributive groups into your native language.

1 high energy content _____
2 important product types _____
3 foreign energy dependence _____
4 FEC facilities operations _____
5 energy facilities ownership _____
6 the energy content reduction _____
7 the GDP energy content reduction rates _____
8 the energy final consumption structure _____

3.6 Underline the words that are possible in these sentences.

1 Living near power (***lanes/links/lines***) may significantly increase a person's risk of death.

2 As of January, 2011 there were a total of 195 nuclear power (***place/ plan/ plant***) units.

3 Coal is the nation's primary (***frame/focus/fuel***) for electric power production.

4 Energy (***effect/effectiveness/efficiency***) is the goal of efforts to reduce the amount of energy required to provide products and services.

5 There were no significant differences in controlling energy (***requests/ rewards/requirements***) between locations.

6 The authorities are looking into the possibility of reducing the state (***privacy /possession /ownership***) in the largest energy company.

7 The negative (***insight/position/impact***) of electricity generation is significant because modern society uses large amounts of electrical power.

8 The three main (***subjects/objects/objectives***) – sustainability, security and competitiveness – can be reached by developing an energy market, reducing energy consumption and promoting innovative low-carbon systems.

4 LANGUAGE REVIEW

4.1 Match the sentences in the Present Perfect with the correct descriptions.

1	__ They have changed some electric installations.	**a**	an action which happened at an unstated time in the past; the exact time is not important, so it is not mentioned
2	__ They have received three faxes this morning.	**b**	an action which has recently finished and which result is visible in the present
3	__ I have just finished the report.	**c**	an action which started in the past and continuous up to the present
4	__ They have known him most of their working life.	**d**	an action which has happened within a specific time period, which is not over at the moment of speaking, such as this morning/week/month, etc.
5	__ She has never been to Paris.	**e**	an action which has just finished

4.2 Complete the sentences by putting the verbs in brackets into either the Present Simple, Present Perfect or Past Simple.

1 When you_____ (***join***) ESC (Electrical Supply Corporation)?

2 That's the best presentation on alternative energy sources I _____ (***hear***).

3 They are going to employ a new secretary. Ann always _____ (***make***) mistakes in costs estimation reports.

4 We _____ (***not have***) any problem when we introduced a new system of the equipment control last summer.

5 Scientists _____ (***make***) some fundamental discoveries in the 18th century.

6 Last week I _____ (***be***) very busy and I _____ (***not/have***) any time to do a lot in the household.

7 Rexel _____ (***operate***) in 36 countries, in three main geographic zones (North America, Europe, and Asia-Pacific) and _____ (***hold***) about a 10% share of the global market of distributed electrical supplies.

8 For more than half a century, GE_____ (***be***) an industry leader in combined cycle technology and today it _____ (***lead***) the industry in combined cycle installations around the world.

9 **A:** _____you ever _____ (***be***) to New York?
B: New York? No I _____ (***never/ be***) there. Have you?
A: Yes. In fact I _____ (***just /come back***) from there. I'm doing some consultancy work there and I _____ (***spend***) at least six weeks there last year.

10 Electricity supply activities _____ (***include***) the generation, transmission and distribution of electricity and the on-selling of electricity via power distribution systems operated by others.

4.3 Make sentences with "*How long …?*" in the Present Perfect.

1 Marie Dupont/ not hear anything from Ellis

2 An employee /suspect that the boss wants to fire him

3 My co-worker /wait for her appraisal interview

4 The engineer/work on the solution to the problem

5 The company/consider a potential partner

6 This opponent/belong to that political party

7 A business/ seek professional help

8 Ms Syms/doubt that Karen Miller would come

9 One official/prefer to remain anonymous

10 The management/believe that they are doing business with their friends

4.4 Make sentences with "*When …?*" in Past Simple.

1 You/get interested in an engineering profession
2 Your friend/choose the profession of an electrical engineer
3 Some students/decide to get engineering profession abroad
4 Many people/start the career in engineering
5 Managers and employees/meet to discuss the organization structure
6 She/test the candidates for the proficiency in the English language
7 The research director/use the Internet to check the information
8 Health and safety inspectors/impose restrictions on the use of the device
9 A small company/start developing its business relations
10 The business contacts /stop socializing with each other

4.5 Complete the dialogue by putting the verbs in brackets into the correct form of the Past Simple or Present Perfect. Reproduce the dialogue in pairs.

Mark: Hi, Matt. I **(1)** _____ (***not see***) you for ages!
Matt: Hi. I'm sorry. I **(2)** _____ (***not be***) in touch withanyone recently. I **(3)** _____ (***be***) really busy.
Mark: What have you been up to then?
Matt: Well, you know I **(4)** _____ (***leave***) my job in March so that I **(5)** _____ (***can***) go freelance as an art lighting designer.
Mark: Yes, I remember, you **(6)** _____ (***talk***) a lot about that last year. How is it going?
Matt: Well, it **(7)** _____ (***be***) really difficult so far. It's much harder work than I **(8)** _____ (***imagine***). **(9)** _____ (***you/ever/be***) self-employed?
Mark: No, never, but I **(10)** _____ (***often/think***) about it. So, why it **(11)** _____ (***be***) so difficult?
Matt: Well, at the beginning I **(12)** _____ (***have***) a couple of good clients. And since then I **(13)** _____ (***have***) a lot of interest from different companies, but none of them **(14)** _____ (***become***) regular customers.
Mark: **(15)** _____ (***try***) to put up a website with examples of your work?
Matt: Yes, I **(16)** _____ (***just/develop***) it. Would you mind to have a look? I'd like to know your opinion.

4.6 Choose the correct option.

1 – Where's Jane?
– She ***has been/ has gone*** out. She should be back in an hour.

2 – John looks happy. He seems to have finalized the deal.
– Yes, he ***has been/ has gone***to the customer and they have signed the contract.

3 – The office is empty.
– Yes, everybody ***has been/ has gone***home.

4 – It's great to see you again with us! Where ***have*** you ***been/gone***?
– I've just returned from our subsidiary.

5 – Where is our Financial Director?
– He was here earlier, but I think he ***has been/ has gone***to the bank now.

5 SKILLS

GIVING A PRRESENTATION

Look through the information about Rexel, one of the leading energy companies. Prepare the presentation of the company history using the facts and events mentioned below.

Through its distribution networks for professional customers in the industrial, residential, and commercial sectors, Rexel provides innovative electrical solutions and equipment to improve comfort, performance, and energy efficiency.

The Group is the preferred partner of all professionals in the electrical chain from electricians to key industrial accounts and equipment manufacturers. For all its customers, Rexel offers a unique range of electrical supplies in terms of its breadth and availability.

Rexel operates in 38 countries with 2.300 branches, a distribution network of more than 40 banners and 30,000 employees. For over 40 years, Rexel has been growing by anticipating the needs of its markets and customers. It remains one step ahead with its offer of innovative solutions of electrical supplies for professionals in the industrial, residential, and commercial sectors.

Milestones

1967 creation of CDME (Compagnie de Distribution de Matériel Electrique) in France

1980 initial expansion in Europe

1983 listed on the Second Marché of the Paris stock exchange

1990 acquired by the PPR group

1993 CDME changes its name to Rexel

1998 initial operations in Australia and New Zealand

1986 entry into the US market

1999 expansion into Eastern Europe

2000 operations start in China and Canada

2005 100% of the share capital of Rexel is acquired by a consortium of investors led by Clayton Dubilier & Rice, Eurazeo and Merrill Lynch Global Private Equity

2006 Rexel acquires Gexpro (formerly GE Supply) in USA

2007 initial public offering of Rexel (Euronext Paris, SBF 120 index)

2008 acquisition of the major European assets of Hagemeyer (No. 3 worldwide)

2009 launch of LEAD 2011, a dynamic company strategy to explore new growth avenues (new energies, large infrastructure projects)

2011 entry into the Indian and Brazilian market

2012 launch of the company plan Energy in Motion

2013 sales of €13 billion

UNIT 7

1 LEAD-IN

1 Why does the energy policy development play the crucial role in any country economy?

2 What determines the main priorities in a country's energy policy?

3 What facilities are considered to be the main electricity producers in Ukraine?

4 Is there a necessity to develop nuclear power in Ukraine? What is the attitude of scientists, politicians and government officials to the issue?

5 Do any energy sectors in Ukraine demand restructuring?

6 How can the introduction of energy efficient technologies influence the energy efficiency and safety?

2 READING

2.1 Examine carefully the following abbreviations. It will help you to understand the text better.

Burshtyn island – *Острова Буриинської ТЕС, яка входить до складу Відкритого акціонерного товариства (ВАТ) «Західенерго» і розташована в 6 км на південний схід від м. Буриин Галицького району Івано-Франківської області*

UCTE – Unionforthe Coordination of Transmission of Electricity– *Енергооб'єднання європейських країн, одне з найбільших енергооб'єднань в світі*

TPP – TPP Nikola Tesla (Thermal Electrical Power Station), a Serbian power plant complex located near the town of Obrenovac

CHP – Combined Heat and Power is the use of a heat engine or a power station to simultaneously generate both electricity and useful heat

NPP – nuclear power plant – *атомнаелектростанція*

HPP – hydroelectric power plant – *гідроакумулююча електростанція*

HPSPP – Haryana Prathmik Shiksha Pariyojna Parishad - *гідроакумулююча електростанція Харьяна в штаті на півночі Індії*

THE MAIN PRIORITIES IN ENERGY POLICY OF UKRAINE

To define the main priorities in the energy policy of Ukraine, it is necessary to take into consideration the following facts:

- the energy system of Ukraine is interconnected with seven power grids of neighbouring states by 75 power transmission power lines,
- the technically feasible amount of electricity interchange is about 50 billion kWh,
- Burshtyn island operates synchronously with UCTE and has potential to increase electricity export,
- the main electricity producers are 14 thermal, 8 hydropower and 4 nuclear power stations with the total capacity of 52 million kW,
- TPP and CHP – 57.8%, NPP – 26.6%, HPP and HPSPP – 9.1%, other sources – 6.5%,
- natural uranium reserves in Ukraine allow meeting the demand of domestic nuclear power sector for over 100 years,
- coal is the only energy carrier, which reserves are sufficient to cover the needs of national economy for over 300 years.

According to the main priorities of the energy policy presented at the European energy forum Ukraine is planning to strengthen its energy security and that of the EU member-countries. Measures to initiate great changes include the following: raising the level of energy efficiency and energy saving of the national economy; improving the nuclear industry and nuclear power sector; ensuring a safe NPPs operation; reconstructing and modernizing the thermal power sector; reducing a negative impact on environment;increasing the regulating generation capacities; providing a higher level of consumption of renewable energy sources; developing the oil and gas sectors; building up the strategic oil stocks; increasing the natural gas reserves; restructuring the coal industry; developing the internal energy market; eliminating the subsidies and price distortions in energy sector.

One of the main tasks of the electricity sector is the parallel operation with the European power grid. It is going to be achieved by the reconstruction

and modernization of TPPs units, the improvement of energy supply reliability in Ukraine's regions, the construction of new high voltage transmission power lines, the development of the nuclear industry and nuclear power sector and the enhancement of NPPs operational safety.

To provide energy efficiency and safety it is necessary to introduce energy efficient technologies, equipment and materials; to stimulate the implementation of energy saving measures; to improve energy accounting and control systems; to ensure higher consumption of alternative and renewable energy sources and to modernize the thermal power utility sector.

2.2 Read the text in 2.3. Then read statements 1 – 11 carefully and mark them as true (T) or false (F).

1 The energy system of Ukraine exists absolutely independently from the energy systems of neighboring counties. ____

2 The operation of the thermal power station on the Burshtyn island can contribute to the electricity export increase. ____

3 There are more hydropower stations than the power stations of other types in Ukraine. ____

4 Coal reserves in Ukraine are sufficient to satisfy the needs of national economy for over 300 years. ____

5 To meet the country's needs in energy generation it is necessary to provide a higher level of energy efficiency and energy saving in national economy. ____

6 It is better to stop developing the nuclear industry and nuclear power sector as it tends to result in a greater danger to people's lives. ____

7 One of the main priorities in the energy policy of Ukraine is to reduce the negative impact of energy production on the environment. ____

8 The focus should be made on a higher level of consumption of the renewable energy sources. ____

9 The coal industry doesn't need any restructuring. ____

10 The electricity sector should provide the parallel operation with the European power grid. ____

11 The introduction of energy efficient technologies is one of the ways to provide energy efficiency and safety. ____

2.3 Read the text again. For sentences 1–3 choose the option *a, b, c* or *d* which you think fits best according to the text.

1 The text primarily discusses
- **a** ___ the worldwide energy policy.
- **b** ___ the main electricity producers.
- **c** ___ the most important things of the energy policy of Ukraine.
- **d** ___ the data on the amount of main energy carriers.

2 According to the facts in the text Ukraine can do everything ECXEPT for
- **a** ___ decreasing electricity export.
- **b** ___ producing nuclear power for 100 years.
- **c** ___ exploiting coal reserves for 300 years.
- **d** ___ interchanging electricity with seven neighboring states.

3 With respect to the main priorities Ukraine will
- **a** ___ present its energy policy at the European energy forum.
- **b** ___ operate parallel with the European power grid.
- **c** ___ reconstruct new high voltage transmission power lines.
- **d** ___ increase the consumption of energy produced.

3 VOCABULARY

3.1 Match the following explanations with the appropriate words.

A

1 __ the act of putting into effect according to or by means of a definite plan or procedure	**a**	consumption
2 __ the social and cultural forces that shape the life of a person or a population	**b**	distortion
3 __ the act of consuming or the state of being consumed; the amount used	**c**	enhancement
4 __ an act or instance of distorting	**d**	environment
5 __ the act of raising to a higher degree; intensifying; magnifying	**e**	implementation

B

1 __ that is replaced naturally or controlled carefully and can therefore be used without the risk of finishing it all	**a**	domestic
2 __ bad or harmful	**b**	natural

3	__	adequate for the purpose; enough	**c**	negative
4	__	existing in or formed by nature	**d**	sufficient
5	__	devoted to home life or household affairs	**e**	renewable

3.2 Fill in the missing word forms as in the example. Use a dictionary, if necessary.

noun (person/device)	***noun (idea)***	***verb***	***adjective***
operator	operation	operate	operatedoperating
reservoir	reservation	_____	_____
presenter	_____	_____	_____
_____	_____	_____	built building
_____	supply	_____	_____
_____	transmission	_____	_____
_____	_____	demand	_____

3.3 Put the word partnerships into the correct column as in the example.

		noun + noun	***adjective + noun***
a	academic degrees	_____	***a***
b	control systems	***b***	_____
c	gas sector	_____	_____
d	energy safety	_____	_____
e	electricity producer	_____	_____
f	main priorities	_____	_____
g	neighboring states	_____	_____
h	nuclear industry	_____	_____
i	power grids	_____	_____
j	power facilities	_____	_____
k	price distortions	_____	_____
l	thermal power	_____	_____
m	total capacity	_____	_____

3.4 Match the sentence beginnings (1-5) to the correct endings (a-c).

1	The energy debate has moved	**a**	to produce power 24 hours a day.
2	Today's energy debate is just	**b**	have done a great job for us in earlier times.
3	People rely on our industry	**c**	about our energy supplies.

4	Conventional types of power	**d**	as challenging as it was 30 years ago.
5	We also must keep the proper perspective	**e**	into a new level of public awareness.

3.5 Underline the words that are possible in these sentences.

1 Oil use (***contributes/integrates/implements***) to pollution and to the release of global-warming gases.

2 Many of our human (***activities/industries/economies***) have an impact on the Earth's biosphere – our home.

3 We live in a global (***economy/policy/country***), where many energy markets are interconnected.

4 Over the next 25 years, the overall (***demand/sector/resource***) for electric power is expected to jump by 50 percent.

5 We must utilize all of our energy (***sources/supply/markets***) – coal, nuclear fission, oil, gas, hydro and renewable sources.

3.6 Complete the following statements with the verbs given below.

impact ensure improve reduce increase

1 National manufacturers need some action to _____ energy supply.

2 The manufactures are planning to _____ energy saving appliances.

3 Our mission is to provide technology solutions to _____ safe, efficient handling of nuclear fuel and high level waste.

4 Proven oil reserves will continue to _____ with time since the beginning of the use of petroleum as an economic resource.

5 Which actions should a company undertake to _____ the negative impact on the environment from company's electric energy consumption**?**

4 LANGUAGE REVIEW

4.1 Match the sentences in the Present Perfect Continuous with the correct descriptions.

1	__ He is absolutely exhausted. He has been working all day long.	**a**	emphasis on duration
2	__ Who has been reading my business papers?	**b**	an action which started in the past and continuous up to the present

3	__	How long have you been learning English?	**c**	an action which started and finished in the past and lasted for some time; the result of the action is visible in the present
4	__	She has been sorting out the mail for an hour.	**d**	to express anger, annoyance or irritation

4.2 Put the verbs in brackets into the correct tense (Present Perfect or Present Perfect Continuous).

1 I _____ (***call***) for you for half an hour. Where _____ (***be***)?

2 _____ (***you/find***) a folder with our catalogues? I _____ (***look***) for it for ages.

3 I _____ (***not/discover***) it yet, but I _____ (***not /work***) for a long time yet.

4 Our engineers _____ (***learn***) English for three years, so their level of language proficiency _____ (***improve***).

5 His voice is gone now because he _____ (***argue***) all morning about the necessity to change the layout of the factory floor.

6 They _____ (***negotiate***) the contract on energy supply for several days, but they _____ (***not achieve***) any progress.

7 You look very tired. You _____ (***work***) very hard lately.

8 He _____ (***read***) the maintenance guide for two hours, but he _____ (***read***) not more than 50 pages so far.

9 Look! Somebody _____ (***delete***) all our files.

10 'Sorry, I'm late.' 'That's all right. I _____ (***not/wait***) long.

4.3 Use the verbs in one of present tenses.

Robert (**1**) _____ (***consider***) himself a successful engineer. He (**2**) _____ (***work***) for 3TIER, which is a global leader in renewable energy information services. They (**3**) _____ (***provide***) scientifically-based assessment and forecasting for wind, solar, and hydro energy. He (**4**) _____(***be***) an Energy Policy Analyst. He (**5**) _____ (***like***) travelling on business and at the moment he (**6**) _____ (***work***) on the projects in France and Germany. He (**7**) _____ (***speak***) fluent German, and he (**8**) _____ (***learn***) French now.

Robert (**9**) _____ (***be***) in his present position for four years. But today he (**10**) _____ (***face***) a dilemma. In the last two weeks he (**11**) _____ (***receive***) two proposals: to get a promotion to the Senior Energy Policy Analyst and to join

another leading company. He (**12**) _____ (***hope***) for a promotion at 3TIER for a long time, but now he (**13**) _____ (***hesitate***). A new company (**14**) _____ (***promise***) a higher salary, better perspectives and the chance to get an experience abroad, he (**15**) _____ (***always/dream***) about.

4.4 Complete the sentences with *some, no* or *any*.

1 The seats aren't reserved. You can have _____ seat you like.
2 We went to the electrical appliances exhibition three days ago and saw _____ new interesting models.
3 Would you like _____ coffee? The General Manager is talking to a client at the moment. He'll see you in a couple of minutes.
4 _____ employee of the company is able to explain you the general policy of the company.
5 I've looked through the report, but there is____ useful information in it.
6 We've phoned _____ hotels, but unfortunately there are ____ rooms available.
7 Our deal with the power generating company was worth ____ $17 billion.
8 My new car uses hardly _____ petrol at all compared to my previous one.
9 We are going on a business trip next month. But I suppose we'll have _____ fun in Paris as well, we are planning to see _____ famous attractions.
10 It's a pity, but _____new ideas were put forward at the meeting.

4.5 Examine the sentences with *each* and *every* and the relevant descriptions.

1	My parents have moved to the capital. **Each** of them works in a bank.	__	for two things, like ***both***, use***each***
2	**Each/Every** child at the party had a piece of cake. **Every** child in the world loves the story of Cinderella.	__	sometimes, ***each = every*** to refer to more than two (***each*** suggests 'one by one', 'separately'; ***every*** suggests 'all together')
3	**Nearlyevery** shop is closed today.	__	***Practically, Nearly, Almost, Not,*** etc. **+ *every***
4	**Every** third-year student will be examined orally in June. They will **each** be given a fifteen minute interview.	__	***every*** ~ all; ***each***~ individual

5	You ask me **every single day** when Joan will be returning and **every single day** I tell you I do not know.	__	***every*** is used for repeated regular events.
6	My mother gave me **every encouragement** when I was a child.	__	***every –*** with a few uncountable things

4.6 Supply *each* or *every* in the following sentences. Sometimes both are possible.

1 Nearly _____ home in the country has the Internet.
2 Here is something for _____ of you.
3 Not _____ student is capable of learning English.
4 Our consulting service will give you _____ assistance if you break down.
5 The admission ticket cost us £5 _____ .
6 They seem to be repairing _____ road in the country.
7 _____road is clearly signposted.
8 There's a fire extinguisher on _____ flour in the building.
9 _____floor in the building has its own fire extinguisher.
10 They are _____ fortunate to have such a good start in life.
11 They both did well and they will _____ receive prizes.
12 You've been given _____ opportunity to do well in this company.
13 I've phoned him twice, but he's been out on _____ occasion.
14 I've been phoning him all week, but he's been out on _____occasion.

5 SKILLS. PROJECT WORK

Write a web page giving the history of an electrical engineering company in Ukraine you know about. Include information about the following:

- the origin of the company, who founded it and when
- key dates in its history
- the opening of new branches, or factories
- services provided
- important contracts and orders it obtained
- its managerial team
- significant recent events

The following words can be useful: *found improve manufacture achieve expand increase develop establish produce begin provide launch reach decrease reduce*

UNIT 8

1 LEAD-IN

1 Do you have any ideas about the future of energy supply challenges?

2 What is any strategy commonly based on?

3 Why is the development of a long-term energy strategy of particular importance for any country?

4 Why is it necessary for Ukraine to present its new energy strategy towards 2030?

5 What do you think should be taken into consideration in the energy strategy development of Ukraine?

2 READING

UKRAINE'S ENERGY STRATEGY TO 2030

(1) One fundamental prerequisite for the application of energy sector budget support programmes is the existence ofa coherent and nationally-driven policy. Ukraine's key energy policy and priorities are defined in its own Energy Strategy to 2030, which was approved by the Cabinet of Ministers in 2006.

(2) The strategy proceeds from the understanding that Ukraine has a limited endowment of conventional energy resources as well as lacks the diverse primaryenergy sources, such as oil, natural gas, and nuclear fuel. Therefore, in order not to rely on imports, the strategy highlights the importance of rational energy use, the promotion of domestic energy production, and switching to alternative energy sources. Obviously, the strategy also recognises the significance of the Ukraine's position as a key transit route for oil and gas from Russia and, therefore, the basic aspect of the strategy is to maintain and enhance this transit role.

(3) The major objectives of the Ukraine's energy strategy are to ensure its energy security and status as a significant transit country. The strategy is inseparably connected with a set of priorities, which include increasing transit volumes via its territory, reducing the economy's energy intensity, improving its energy efficiency, integrating with the European energy system and expanding the domestic energy production. In order to meet these objectives and priorities a

set of policy measures is specified. They include modernizing the infrastructure that transports hydrocarbons, thus diversifying supplies and routes, increasing the domestic production of coal and nuclear energy, implementing broad-ranging energy efficiency measures, adopting relevant EU laws and undertaking the pricing reform. Moreover, the measures represent a radical shift in the governing principles of the Ukraine's energy sector. They require the move from a monopoly organisation to more competitive structures, the modification of the state role from a manager to regulator, and the provision of the opportunities for the private sector participation in the energy policy.

(4) The Energy Strategy to 2030 represents a significant milestone as it provides an overview and the strategy of the energy sector according to the state programmes developed mostly in the 1990s for the various subsectors. Nevertheless, some of the projections in the strategy are contentious as they were not developed on a basis of the detailed statistical data and models. The emphasis is made on the necessity to take measures to meet energy demand and provide efficiency. The strategy lacks the specific measures to meet its stated objectives and therefore it is difficult to assess possible developments and to realise the targets.

(5) The strategy calls for significant energy savings by the end of the projection period (a 50 per cent reduction in energy intensity compared to 2005). The savings are supposed to be derived from some structural shifts in the economy, as it moves from the heavy industry to the tertiary sector, and significant technological improvements. The document also envisages the increase in the production of coal and nuclear power in two or more times to reduce reliance on natural gas. While the projected energy savings and structural changes are feasible, in the context of other countries' experience, the document lacks the detailed, specific and concrete actions (including financing and regulatory/legislative changes) that are necessary to meet the ambitious targets set by the strategy.

2.1 Look through the text quickly and decide which of the sentences (A–F) sum up best what each of the paragraphs (1– 5) is about. There is one extra sentence that you do not need to use.

A — Measures to ensure the significance of the Ukraine's position as a key transit route.

B — The officially accepted planned actions of the Ukraine's government.

C — The drawbacks of the Ukraine's energy status and the ways to cope with the energy production situation.

D — Ukraine has approved the situation in the electricity sector.

E — The expected achievements due to the Energy Strategy by the end of the projection period.

F — The contentious situation around the provision of the Energy Strategy to 2030.

2.2 Look through the text again and then match the sentence beginnings (1–7) to the correct endings (a–g).

1 __ In 2006 the Cabinet of Ministers approved

2 __ The Ukraine's Energy Strategy was developed because the country

3 __ Ukraine can ensure its energy security and status with

4 __ The policy measures involve

5 __ The Ukraine's Energy Strategy has disadvantages

6 __ The strategy lacks

7 __ These issues will be

a because some of the projections were not developed on the basis of detailed statistical data and models.

b discussed and further elaborated.

c a set of policy measures.

d a radical shift in the governing principles of the Ukraine's energy sector, the modification of the state role from a manager to regulator, and the provision of the opportunities for the private sector participation in the energy policy.

e had a limited endowment of conventional energy resources and also lacked the diverse primary energy sources.

f the Ukraine's Energy Strategy to 2030.

g specific measures to meet its stated objectives.

2.3 Read the text again. For sentences 1–4 choose the best answer *a, b, c* or *d*.

1 The Ukraine's key energy policy and priorities are defined and formulated

a __ in the papers ofthe Cabinet of Ministers.

b __ in the energy forecast.

c __ in thebudget support programmes

d __ in the Energy Strategy to 2030.

2 Special measures will be undertaken

a __ to limit energy resources.

b __ to diminish the Ukraine'stransit role.

c __ to highlight the importance of rational energy use.

d __ not to rely on energy import.

3 The Ukraine's energy sector

a __ demands reconstruction.

b __ attracts growing attention in Europe.

c __ has a competitive structure.

d __ develops on the basis of detailed statistical data.

4 The ways to provide significant energy savings include everything EXCEPTfor

a __ the reduction in energy intensity.

b __ the structural shifts in the economy.

c __ moving away from heavy industry.

d __ the coal and nuclear power production growth.

3 VOCABULARY

3.1 Match the following words from the text in 2.3 to make up word partnerships. Use them in the sentences of your own.

1	__	energy	**a**	production
2	__	rational	**b**	fuel
3	__	state	**c**	sector
4	__	domestic	**d**	sources
5	__	transit	**e**	savings
6	__	energy	**f**	use
7	__	nuclear	**g**	ownership
8	__	private	**h**	route

3.2 Match the adjectives with the nouns or phrases (1–10)to make up word partnerships. Use them in sentences of your own.

ambitious ***conventional*** ***fundamental*** ***major*** ***similar***
alternative ***domestic*** ***heavy*** ***natural*** ***specific***

1	_____	actions	**6**	_____	industry
2	_____	energy production	**7**	_____	issues

3	_____	energy resources	**8**	_____	objectives
4	_____	energy sources	**9**	_____	prerequisite
5	_____	gas	**10**	_____	targets

3.3 Which word or expression from the text in 2.3 can mean the following?

A	**1**	___	accept officially	**a**	enhance
	2	___	improve something	**b**	approve
	3	___	begin or attempt (something)	**c**	milestone
	4	___	a significant point in development	**d**	undertake
	5	___	involve something as a necessary part or result	**e**	infrastructure
	6	___	the basic systems and structures that a country or organization needs in order to work properly	**f**	entail
	7	___	combine some elements in a way that makes something more effective	**g**	rehabilitate
	8	___	to restore to good condition, operation, or capacity	**h**	integrate
	9	___	to look forward to (something)	**i**	implement
	10	___	begin to do or use (something, such as a plan)	**j**	anticipate

B	**1**	the fact of owing something		**a**	_____
	2	the act of making something better		**b**	_____
	3	the complete control, possession or use of something		**c**	_____
	4	the basic systems and services that are necessary for a country or an organization		**d**	_____
	5	something that must exist or happen before something else can happen or be done		**e**	_____

3.4 Complete the following table. Write five sentences of your own with the new words.

verb	***infinitive***	***-ing form***	***past participle***
assist	_____	_____	_____
develop	_____	_____	_____
promote	_____	_____	_____
participate	_____	_____	_____
regulate	_____	_____	_____
transport	_____	_____	_____

3.5 Choose the right words to fit into thegaps and read about the energy perspectives in the USA.

resources generation emissions dramatically demand fuel trends relies activities

Market **(1)**_____suggest that the demand for energy **(2)**_____will rise **(3)**_____over the next 25 years:

- Global **(4)** _____ for all energy sources is forecast to grow by 57% over the next 25 years.
- U.S. demand for all types of energy is expected to increase by 31% within 25 years.
- By 2030, 56% of the world's energy use will be in Asia.
- Electricity demand in the U.S. will grow by at least 40% by 2032.
- New power **(5)**_____equal to nearly 300 (1,000MW) power plants will be needed to meet electricity demand by 2030.
- Currently, 50% of U.S. electrical generation **(6)**_____on coal, a fossil **(7)** _____; while 85% of U.S. greenhouse gas **(8)** _____ result from energy-consuming **(9)** _____ supported by fossil fuels.

3.6 Underline the words that are possible in these sentences.

1 The government requires continual ***improvement/demand/increase***in energy and resource use efficiency.

2 Nationally-driven ***policy/politics/problem*** concerning the production and distribution of energy has existed for many years.

3 One of the biggest issues that the government is facing is the high cost of the ***domestic/home/inside*** energy production.

4 Iran is the most secure, most economical natural gas transit ***road /role/ route*** for Central Asian republics.

5 Ukraine is situated right in the intersection of oil and gas ***translation / transportation /transformation*** routes of the Eurasian continent.

6 Surprisingly, there wasn't much ***discussion/debate/quarrel*** at the meeting about the necessity to reconstruct the electrical shop.

7 A new factory provided jobs in the region where there wasn't much***job/work/jobs*** employment.

8 I don't have much ***information/details/facts/news*** to help you in these circumstances.

9 Many ***questions/research/problems*** need to be considered before the final decision can be made.

10 Are there many ***equipment/computers/facilities*** at your plant?

3.7 Complete the sentences with correct forms of the capitalized words in brackets.

Energy Production and Use

The **(1)**_____ **(**PRODUCE**)** and use of energy are sensitive to changes in the climate. For example, **(2)** _____ **(**INCREASE**)** temperatures will reduce the**(3)** _____ **(**CONSUME**)** of energy for **(4)** _____ **(**HEAT**)** but increase energy used for **(5)** _____ **(**COOL**)** buildings. The implications of climate change for energy supply are less clear than for energy demand.

Climate change effects on energy supply and demand will depend not only on **(6)** _____ **(**CLIMATE**)** factors, but also on the patterns of the **(7)** _____ **(**ECONOMY**)** growth, land use, **(8)** _____ **(**POPULATE**)** growth and distribution, **(9)** _____ **(**TECHNOLOGY**)** change and social and cultural trends that shape individual and **(10)** _____ **(**INSTITUTION**)** actions.

4 LANGUAGE REVIEW

4.1 Match the sentences in the Past Perfect or Past Perfect Progressive with the correct description.

1	__	They had left before we got to the office.	**a**	a complete past action which had visible results in the past
2	__	He had been working as an electrical engineer for 15 years before he resigned.	**b**	a past action of certain duration which had visible results in the past
3	__	They were sad because they had failed the test.	**c**	life experience before some past action
4	__	She had never been abroad, and it was her first business trip to a foreign country.	**d**	a past action which occurred before another past action or before a stated past time
5	__	They were absolutely exhausted because they had been working since the morning.	**e**	an action continuing over a period up to a specific time in the past

4.2 Rewrite the sentences using the Past Simple or the Past Perfect Tenses.

1 Mike finished reading the instructions. Then he left the office.
When Mike _____ .

2 She stepped into her office. The telephone rang.
She _____ just _____ .

3 They became famous. They presented their first model.
_____ only after _____ .

4 Mary shook his hand. She saw him before.
As Mary _____ she realized that _____ .

5 Our company put a lot of money into developing advanced technology. The company became profitable.
Only after our company _____ .

4.3 Put the verbs in brackets into one of the past tenses.

1 When I _____ (***arrive***), I _____ (***register***) at the reception and _____ (***go***) straight to the conference hall.

2 I _____ (***work***) hard, so I _____ (***feel***) that I _____ (***deserve***) a holiday.

3 When the supervisor_____ (***come***), I _____ (***finish***) all my work, so I _____ (***have***) very little to do.

4 I _____ (***always/believe***) that with my speciality it would be very easy to get the job.

5 We _____ (***discuss***) the report about the results of the starting test for over an hour when we _____ (***agree***) that Mike had to prepare some information before the next meeting.

6 How _____ you _____ (***feel***) when you _____ (***hear***) about moving our office?

7 I _____ (***know***) that they _____ (***already/deliver***) all lighting installations.

8 The technician _____ (***install***) some new software on my PC when the short circuit _____ (***occur***).

9 Robert _____ (***try***) to change a light bulb when he _____ (***slip***) and _____ (***fell***).

10 We _____ (***be***) late because we _____ (***have***) some car problems. By the time we _____ (***get***) to the train station, Susan _____ (***wait***) for us for more than two hours.

4.4 Choose the correct option.

1 **A:**Are you going to test the system?
B: No, I_____ it yesterday.
a did **b** had done **c** had been doing

2 **A:** Did you see the project manager?
B: No, he _____ by the time I arrived at the site.
a was leaving **b** had been leaving **c** had left

3 **A:**How often do you have to read design specifications?
B: I _____ do it every day.
a recently **b** usually **c** never

4 **A:**Did the electrician arrive on time?
B:No, I _____ for an hour before he arrived.
a was waiting **b** had waited **c** had been waiting

5 **A:**This installation is very efficient. Is it new?
B: No, we _____ it for ages.
a had **b** have **c** have had

6 **A:** What time do you finish work?
B: Actually, I _____ .
a have just finished **b** finish **c** had just finished

7 **A:**What about the financial situation with the project?
B: It _____ better slowly.
a gets **b** is getting **c** has been getting

8 **A:** Where is Ann?
B:She _____ on the phone when I saw her.
a was talking **b** talked **c** had talked

9 **A:** Did you enjoy your trip?
B:Yes, we _____ at a fabulous hotel. The company paid for all our expenses.
a have stayed **b** had stayed **c** stayed

10 **A:** Sorry for being late.
B: We _____ our discussion.
a had almost finished **b** almost finishes **c** have almost finished

4.5 Underline the correct option. Reproduce themini dialogues in pairs.

1 – This year we have a lot of orders.
– Yes, but not as ***many/much*** as we used to.

2 – We'd better hurry.
– Definitely. The bus goes in ***few/a few*** minutes.

3 – We've got so ***much/ many*** work to do.
– I suppose we'll be in the office till late.

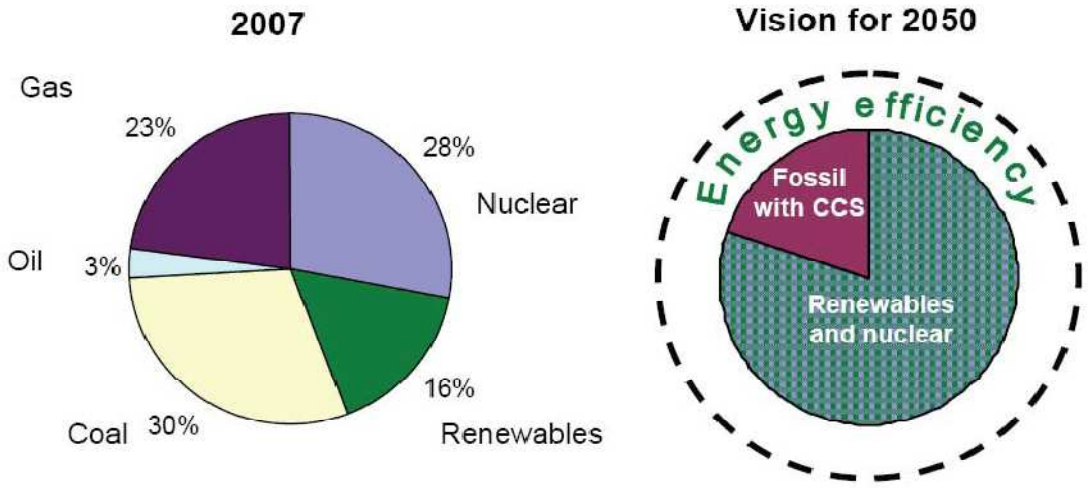
4 – There is ***much/many*** enthusiasm for this idea.
– I absolutely agree. I'm sure we'll get a success.
5 – They have made ***little/few*** progress in their research.
– Now I understand why they look so upset.
6 – Therehas been ***much/many*** debate about his article.
– Yes, I've heard. He has ***a lot of/much*** fresh ideas.
7 – ***Many/much*** remains to be done before we launch the installation.
– Yes, we have to check up ***a lot/a little***.
8 – They didn't show ***much/many*** interest in our new electrical equipment.
– Do you think they are not going to sign the contract?

5 SKILLS

PROJECT WORK

Acquaint yourself with the opinion of Gunther H. Oettinger, European Commissioner for Energy. Analyze the charts below and formulate the priorities for European energy policy in the coming years.

Sources of electricity production in the EU today and tomorrow



'Energy is the heart of our economy and our society. If we invest in our energy system, we are investing in the future. If, however, we neglect our energy supply and energy efficiency, the consequences could be profound and irreversible. In this respect, our plans regarding energy technology and infrastructure are crucial.'

'I would like to specifically highlight three topics that are of fundamental importance for the proper functioning of the internal market in energy and our future energy supply, namely technology, infrastructure and finances.'

Gunther H. Oettinger, European Commissioner for Energy

UNIT 9

1 LEAD-IN

1 Have you ever thought who has created all the many thousands of little and big things we use in our everyday lives?

2 When you hear the word *scientist*, do you think about someone who is male?, female?, boring?, well paid?, or responsible? or all five?

3 Does scientific and technological progress bring only a positive influence on the life of people?

4 Do scientists or engineers make our everyday lives easier? Say your reasons.

5 Can you list at least three things that any scientist can do to help build a better world?

6 Give any example of scientific inventions which lately were against the humanity and brought catastrophic consequences?

7 What do you think about the necessity of the socio-ethical control of science? Does it concern the power industry as well?

2 READING

'Knowledge comes, but wisdom lingers.'

Alfred Tennyson

THE ETHICS AND SOCIAL RESPONSIBILITY OF SCIENTISTS AND TECHNOLOGISTS

(1) Modern scientific and technological progress has raised the following complicated problems of the social responsibility of scientists:

• How far are scientists responsible for the application of their work?

• If they are, how can they best do their responsibility?

• What is the ethics of scientific exploration?

• How does it relate to the universal ethical values of mankind?

• Finally, a number of scientists have raised the problem of the socio-ethical control of research referring to the man, the justification for a moratorium on some fields of research threatening the man and the entire mankind.

• Is such control possible in any form?

• Will it not restrict the freedom of research?

• How does this freedom relate tothe social and humanistic responsibility of scientists and technologists?

(2) Scientists are realizing more and more clearly the indisputable fact that their social responsibility, the role of the ethical principle in science should grow in geometrical progression, if mankind and science develop in an arithmetic progression. The ethics of science is being asserted as a *sine qua non*[*] of effective performance of human-oriented scientific research. There is no alternative to this either for science or for humanity.

(3) In mastering nuclear energy the man has developed a power that, unless controlled by his intellect, could extinguish the life and snuff out our planet's blue glow. This idea is convincingly proved by the disaster at the Chornobyl atomic power station in Ukraine. Such accidents take place because of the lack of knowledge in the fields of natural and technical sciences and of the lack of consciousness of the negative consequences resulting from the application of the scientific and technological innovations.

(4) Science and technology are not a source of ethics and values. They

can tell you how many people might be killed by a nuclear bomb, but the decision on whether to develop the bomb cannot be a scientific decision. This can only be judged by something outside science that is by ethics. Scientists and technologists should be aware of the consequences of their discoveries, projects.

(5) Hence the crucial importance is attached today to the problem of the socio-ethical control of science with a view to its humanistic orientation and development as a science for the man. We need a new ethics and it must be many-sided. The belief that only one idea is true is highly dangerous. If you have only one way of looking at the world you abuse it. The new ethics must recognize that there are many ways out of the human predicament, which present different aspects of the same situation. Only on the basis of such an ethical attitude can we solve the problems that threaten the world today.

[*] *sine qua non –необхідна умова*

2.1 Look through the text quickly and decide which of paragraphs (1-5) mentions

__ negative consequences of the application of scientific and technological innovations.

__ situations that cause difficulties or are difficult to deal with.

__ the necessity of directing the activities of scientists.

__ the gradual change of social responsibility of scientists regarding the development of mankind and science.

__ moral rules and principles of behaviour for deciding what is right or wrong.

2.2 Read statements (1-6) carefully and mark them as true (T) or false (F).

1 As scientific and technological progress stimulates human development, there is not any necessity to raise a problem of the social responsibility of scientists. __

2 It is never reasonable to restrict the freedom of research. __

3 The role of the ethical principle is growing faster than the science itself. __

4 Nuclear energy is considered to be particularly dangerous unless controlled by the human intellect. __

5 Scientists and technologists can't be responsible for the consequences of their discoveries. __

6 New ethics must be many-sidedand must recognize that there aremany ways out of the human predicament. __

2.3 Read the text again. For sentences 1–3 choose the option *a, b,* or *c* which you think fits best according to the text.

1 The problem of the social responsibility of scientists results from

a ___ the effective performance of scientific research.

b ___ the insufficient control of science and its development.

c ___ a moratorium on some fields of research threatening the man and the entire mankind.

2 The lack of consciousness of scientists and technologists can result in

a ___ the lack of knowledge in the fields of natural and technical sciences.

b ___ the crucial importance of new discoveries and projects.

c ___ the negative consequences resulting from the application of the scientific and technological innovations.

3 The basis of new ethics of scientists should be

a ___ modernscientific and technological progress.

b ___ the development of mankind and science in an arithmetic progression.

c ___ the socio-ethical control of science with a view to its humanistic orientation and development as the science for the man.

3 VOCABULARY

3.1 Match the following wordsfrom the texts in 2.3 to make up word partnerships.

A	**1**	___	be responsible	**a**	by the disaster
	2	___	be related	**b**	for the application
	3	___	be judged	**c**	to the universal values
	4	___	be aware	**d**	by sth outside science
	5	___	be proved	**e**	of the consequences
B	**1**	___	the application	**a**	of mankind
	2	___	the fields/freedom	**b**	of exploration
	3	___	the control	**c**	for man
	4	___	the values	**d**	of research/science
	5	___	the science	**e**	of work/innovations

3.2 Match the definitions (1–5) on the left to the words (a–b) on the right.

A	**1**	___	to learn or understand sth completely	**a**	to develop
	2	___	to do or have what is required or necessary	**b**	to extinguish
	3	___	to be a danger to sth	**c**	to threaten
	4	___	to destroy sth	**d**	to fulfill
	5	___	to think of or produce a new idea, product, etc. and make it successful	**e**	to master
B	**1**	___	a careful study of a subject	**a**	consciousness
	2	___	how well or badly you do sth	**b**	decision
	3	___	knowledge about the structure and behavior of the natural and physical world	**c**	performance
	4	___	a choice or judgment that you make after thinking	**d**	research
	5	___	the state of being aware of sth	**e**	science

3.3 Match the sentence beginnings (1-5) to the correct endings (a-c).

1 ___ The goal of scientists and technologists is
2 ___ Scientists and technologists should
3 ___ The experts can prevent problems
4 ___ Science is a great source of power,
5 ___ The ethics and responsibility of science should be

a an integral part of the education and training of all scientists.
b a major driver of social change.
c at an early stage when it is easier to take action.
d protect the society's interest as their own.
e to increase the body of human knowledge.

3.4 Complete the following passage with the words given below.

successful	***scientists***	***communicate***	***scientific***
researchers	***practitioners***	***others***	***students***

The Social Foundations of Science

Throughout the history of science, philosophers and **(1)** _____ have sought to describe a single systematic procedure that can be used to generate **(2)** _____ knowledge, but they have never been completely **(3)** _____. The practice of science is too multifaceted and its **(4)** _____ are too diverse to be captured in a single overarching description. **(5)** _____ collect and analyze data, develop hypotheses, replicate and extend earlier work, **(6)** _____ their results with **(7)** _____, review and critique the results of their peers, train and supervise associates and **(8)** _____ , and otherwise engage in the life of the scientific community.

3.5 Complete the sentences withthe correct forms of the capitalized words given in brackets.

1 Scientific discovery leads _____ to technology which often changes the world in permanent and violent ways. **(**DIRECT**)**
2 I think it's unethical to put the world's most _____ technology into the hands of the people who have done the most harm to the world. **(**ADVANCE**)**
3 It is a multi-disciplinary journal that explores _____ issues of direct concern to scientists and engineers. **(**ETHIC**)**

4 Science is much more than curiosity; it is observing, measuring, analyzingand _____the facts. **(**ACCUMULATE**)**

5 Social responsibility is becoming an ever more important issue in the _____ of science and society. **(**INTERACT**)**

4 LANGUAGE REVIEW

4.1 Match the sentences with the correct description of the future forms.

1	__	What are you doing next Tuesday?	**a**	predictions about the future
2	__	I'm sure they will like a new design.	**b**	on-the-spot decisions or offers
3	__	Look at the sky! It is going to rain.	**c**	actions/events/situations which will definitely happen in the future and which cannot be controlled
4	__	Jim's plane leaves at 10 tomorrow morning.	**d**	promises, threats, warnings, requests, hopes
5	__	I'm going to change the plan.	**e**	intentions and ambitions
6	__	I'm sorry to hear that. I'll find out what the problem is right now.	**f**	predictions when there is evidence that something will happen in the near future
7	__	By the end of this month, he'll have been working in the company for ten years.	**g**	fixed arrangements in the near future
8	__	This time next week we'll be signing a contract.	**h**	timetables/programmes
9	__	It is not necessary to phone Tom. I'll be seeing him at work later on today.	**i**	actions which will be in progress at a stated future time
10	__	She will be 30 this year.	**j**	actions which will definitely happen in the future, as a result of a routine or arrangement
11	__	By the end of the year we'll have sold around 1,000 installations.	**k**	when we ask politely about someone's plans for the near future, in order to see if our wishes fit in with their plans

12	__	Stop being late all the time or I'llfire you.	**l**	for actions which will be finished before a stated future time
13	__	Will you be going to the head office this afternoon? Could you take these papers with you?	**m**	to emphasise the duration of an action up to a certain time in the future.

4.2 Put the verbs in brackets into the correct tense denoting a future activity.

1 **A:** I'm so tired. I have been working all night and I'm about to fall asleep.
B: I _____ (***get***) you some coffee.

2 **A:** They don't like him to know about our new model.
B: I promise I _____ (***not/tell***) him about it.

3 **A:** Is Jerry going with us to the branch office?
B: I don't know, but I _____ (***see***) him at the meeting tomorrow. I _____ (***ask***) him then.

4 **A:** _____(***you, do***) me a favour, Sam?
B: Sure, what do you want me to do?
A: I _____ (***change***) the burnt out light bulb in the lamp above the desk. I need someone to hold the ladder for me while I am up there.
B: No problem, I _____ (***hold***) it for you.

5 **A:** The phone is ringing.
B: I _____ (***get***) it.

6 **A:** I heard you're taking a French class at the community college.
B: Yeah, I _____ (***go***) to Paris next spring and I thought knowing a little French would make the trip easier.

7 **A:** I'm arriving next Friday.
B: When you _____ (***get off***) the plane, I _____ (***wait***) for you.

8 **A:** How are you today?
B: I am sick of rain and bad weather! Hopefully, when we _____ (***wake***) up tomorrow morning, the sun _____ (***shine***) .

9 **A:** How is the report? Is it typed?
B: Not yet, but I _____ (***finish***) it by 11 o'clock.

10 **A:** What are your future plans?
B: I know definitely that _____ (***not study***) engineering. I'm rather bad at maths.

11 **A:** If you _____ (***need***) to contact me sometime next week, I _____(***stay***) at the Sheraton in San Francisco.

B: OK. Let's keep in touch.

12 **A:** It is so hot in here!

B: I _____ (***turn***) the air-conditioning on.

13 **A:** What _____ (***plan***) to do this summer?

B: I _____ (***spend***) a couple of weeks with my family and then _____(***go***) somewhere in Europe.

14 **A:** We are late.

B: Yes, this taxi is so slow. By the time we get there, the meeting _____ (***finish***).

15 **A:** _____ (***you/use***) the conference room next Tuesday?

B: I'm not sure yet.

4.3 Rewrite the sentences using *be (not) to, due to, about to, on the point of, plan/intend/propose/hope/agree/promise (not) to.*

1 You will arrive at the office at 7.30 in the morning

2 They are making plans. They are going to install a new lighting control system.

3 Do you promise that you won't tell anyone about this incident?

4 I hope our company will meet future energy needs and adapt to new environmental regulations.

5 The economy will collapse in the very near future; it will happen at any time now.

6 The Government has made a promise. They will not increase payment for electrical energy during the next year.

7 I'm sorry I can't talk to you now. I'm going to the meeting in a minute.

8 You must not enter the building of the power plant without signing your name in the register.

9 The City Council has decided what they would like to do one day. They are going to close the nuclear power plant.

10 The train will depart at 8.25.

11 The factory will be closed for three weeks for repairs.

12 The Chief Executive is going to announce his resignation.

4.4 Rewrite the sentences using*both … and, either … or, neither … nor,* or *not only … but also*.

1 James wants to take an electrical engineering training course in Edinburgh; so does David.

2 Tracy hasn't been to a business trip abroad and Stella hasn't either.

3 The teachers thought the exam results were unfair and so did the students.

4 James will bring the manuals, or else Paul will.

5 Mary and David are not particularly creative.

6 Cathy is going to the meeting, or else Andrea is.

7 Mike hasn't seen the project yet, neither has Daniel.

4.5 Fill in *all, every, none, both, either, neither.*

A **Mary:** Have you decided what electrical engineering company you would like to apply fora job?

John: Not yet. I have visited some electrical engineering companies in our city, but **(1)** _____ of them need somebody with at least five-year experience in the field. **(2)** _____ of them provide training. But I want **(3)** _____ to get some experience and have some prospects for promotion.

Mary: Why don't you try to send your CV and covering letters to smaller companies? Two friends of mine did it. **(4)** _____ found the job and were successful. In fact, **(5)** _____ of them is complaining. You have to startfrom something.

John: Right you are.I'll try. I've seen a couple of advertisements. **(6)** _____ were quite interesting.

B **Alice:** Have you decided where to go on holiday?

Judy: Not yet. I have a brochure but **(7)** _____ the hotels are so expensive. **(8)** _____ of them provide full-board and I want **(9)** _____ half-board or self-catering.

Alice: Why don't you rent a room? **(10)** _____ people say it is cheap and enjoyable if you share a room.

Judy: Alright, let's have a look at some rooms in Italy or Spain. They **(11)** _____ look nice and I see that **(12)** _____ room has a sea-view. **(13)** _____ of the hotel rooms available has any view at all.

Alice: Right – so it's **(14)** _____ Italy _____Spain.

Judy: Yes. **(15)** _____ of them look**s** perfect.

5 SKILLS

PROJECT WORK

As a result of the current discussion how further global warming could be prevented or at least mitigated, the revival of nuclear power seems to be in everybody's or at least in many politicians' and scientists' mind.
Workin two teams. The first team must put forward the arguments to support the idea of nuclear power development, while the other one must present the opposite point of view. You can use the ideas mentioned below.

PROS OF NUCLEAR POWER

- Nuclear power generation does emit relatively low amounts of carbon dioxide (CO2). The emissions of greenhouse gases and the contribution of nuclear power plants to global warming is therefore relatively little.
- This technology is readily available, it does not have to be developed first.
- It is possible to generate a high amount of electrical energyat one single plant.

CONS OF NUCLEAR POWER

- The problem of radioactive waste is still an unsolved one. The waste from nuclear energy is extremely dangerous and it has to be carefully looked after for several thousand years (10,000 years according to United States Environmental Protection Agency standards).
- High risks: Despite a generally high security standard, accidents can still happen. It is technically impossible to build a plant with 100% security. A small probability of failure will always exist. The consequences of an accident would be absolutely devastating both for human beings and for the nature.
- Nuclear power plants as well as nuclear waste could be preferred targets for terrorist attacks. No atomic energy plant in the world could withstand an attack similar to the tragedy on September 11in New York. Such a terrorist act would have catastrophic effects for the whole world.
- During the operation of nuclear power plants, radioactive waste is produced, which in turn can be used for the production of nuclear weapons.
- The energy source for nuclear energy is Uranium. Uranium is a scarce resource; its supply is estimated to last only for the next 30 to 60 years depending on the actual demand.
- The time frame needed for formalities, planning and building a new nuclear power generation plant is in the range of 20 to 30 years.

UNIT 10

LEAD-IN

1 What well-known natural phenomena are associated with electricity?

2 What do you know about the first manifestations of electricity that the humanity came across?

3 Do you know who

- presented the idea that electricity had positive and negative elements and that the flow was from positive to negative?
- proved that lightning was a form of electricity?
- developed the first electric battery?
- discovered magnetic induction?
- invented the electric light bulb?
- discovered electric waves and how to measure them?
- developed the first AC motor?

2 READING

2.1 Read the title of the text and try to predict what information is presented and what facts are mentioned in it. Then read the text quickly to check outyour ideas.

FROM THE HISTORY OF ELECTRICITY

Electricity is a general term encompassing a variety of phenomena resulting from the presence and flow of electric charge. These include many easily recognizable phenomena, such as lightning, static electricity, and the flow of electrical current in an electrical wire as well as less familiar concepts such as the electromagnetic field and electromagnetic induction.

The word is from the New Latin ēlectricus, ‘amber-like’, coined in the year 1600 from the Greek ήλεκτρον (electron) meaning amber (hardened plant resin), because static electricity effects were produced classically by rubbing amber.

Electrical phenomena have been studied since antiquity, though advances in the science were not made until the seventeenth and eighteenth centuries. Practical applications for electricity however remained few, and it would not be

until the late nineteenth century that engineers were able to put it to industrial and residential use. The rapid expansion in electrical technology at this time transformed industry and society. Electrical power is the backbone of modern industrial society, and is expected to remain so for the foreseeable future.

Long before any knowledge of electricity existed people were aware of shocks from electric fish. Ancient Egyptian texts dating from 2750 BC referred to these fish as the ‘Thunderer of the Nile’. Electric fish were again reported millennia later by ancient Greek, Roman and Arabic naturalists and physicians. Possibly the earliest and nearest approach to the discovery of the identity of lightning, and electricity from any other source, is to be attributed to the Arabs, who before the 15th century had the Arabic word for lightning (raad) applied to the electric ray. Ancient cultures around the Mediterranean knew that certain objects, such as rods of amber, could be rubbed with cat’s fur to attract light objects like feathers. Thales of Miletos made a series of observations on static electricity around 600 BC, from which he believed that friction rendered amber magnetic, in contrast to minerals such as magnetite, which needed no rubbing. Thales was incorrect in believing the attraction was due to a magnetic effect, but later science proved a link between magnetism and electricity.

Electricity would remain little more than an intellectual curiosity for millennia until 1600, when the English scientist William Gilbert made a careful study of electricity and magnetism, distinguishing the lodestone effect from static electricity produced by rubbing amber.

Further work was conducted by Otto von Guericke, Robert Boyle, Stephen Gray and C. F. du Fay. In the 18th century, Benjamin Franklin conducted extensive research in electricity, selling his possessions to fund his work. In June 1752 he is reputed to have attached a metal key to the bottom of a dampened kite string and flown the kite in a storm-threatened sky. A succession of sparks jumping from the key

to the back of the hand showed that lightning was indeed electrical in nature.

In 1791, Luigi Galvani published his discovery of bioelectricity, demonstrating that electricity was the medium by which nerve cells passed signals to the muscles.

Alessandro Volta's battery, or voltaic pile, of 1800, made from alternating layers of zinc and copper, provided scientists with a more reliable source of electrical energy than the electrostatic machines previously used. The recognition of electromagnetism, the unity of electric and magnetic phenomena was due to Hans Christian Oersted and André-Marie Ampère in 1819-1820.

Michael Faraday invented the electric motor in 1821, and Georg Ohm mathematically analysed the electrical circuit in 1827. Electricity and magnetism were definitively linked by James Clerk Maxwell, in particular in his 'On Physical Lines of Force' in 1861 and 1862.

While the early 19th century had seen rapid progress in electrical science, the late 19th century saw the greatest progress in electrical engineering. Through such people as Nikola Tesla, Thomas Edison, Ottó Bláthy, Ányos Jedlik, Sir Charles Parsons, Joseph Swan, George Westinghouse, Ernst Werner von Siemens, Alexander Graham Bell and Lord Kelvin, electricity was turned from a scientific curiosity into an essential tool for modern life, becoming a driving force for the Second Industrial Revolution.

2.2 Mark the statements as true (T) or false (F).

1 Static electricity effects were first noticed while metal was being rubbed. ___

2 As electrical phenomena have been known since antiquity, the electricity has been in significant use since then as well. ___

3 Electrical power is going to be the priority in a modern industrial society in the foreseeable future. ___

4 Possibly Egyptians were the first to approach the identity of electricity from any other source. ___

5 The Mediterraneans were aware of the fact that some rubbed objects attracted light things. ___

6 William Gilbert is known to have distinguished the lodestone effect of static electricity. ___

7 Benjamin Franklin's experiments were supported and hugely funded. ___

8 Alessandro Volta is known to be the inventor of the electric motor. ___

2.3 Answer the following questions to the text.

1 What induces electricity?

2 What words was the word *electricity* derived from?

3 When did people start using electricity for their practical needs?

4 How did William Gilbert's experiments contribute to the study of electricity?

5 What important experiment was conducted by Benjamin Franklin in the 18th century? What did it prove?

6 What other important inventions in the theory of electricity were made by scientists in the 18th century?

7 How can the 19th century progress in electrical science be characterised? How important was the stage for the development of humanity?

3 VOCABULARY

3.1 Match the following words from the text to make up word partnerships. Use them in the sentences of your own.

1	foreseeable	**a**	application
2	residential	**b**	use
3	modern	**c**	future
4	practical	**d**	culture
5	intellectual	**e**	use
6	electrical engineering	**f**	engineering
7	ancient	**g**	curiosity
8	industrial	**h**	society

3.2 Use the following suffixes to form nouns from the words given below.

-ist -tion -ity -sion

1	recognise	***+-tion***	recognition
2	science	_____	_____
3	curious	_____	_____
4	observe	_____	_____

5	antique	_____	_____
6	expance	_____	_____
7	nature	_____	_____

3.3 Match the commonnotions of electricity with relevant definitions.

1	electromagnetic induction	**a**	The generation of a magnetic field around a current-carrying conductor.
2	electric charge	**b**	The combination of an electric (E) field and a magnetic (H) field.
3	static electricity	**c**	Any of a class of devices, consisting of a group of electrochemical cells that convert chemical energy into electrical energy.
4	electromagnetism	**d**	The force (voltage) that produces an electric current in a circuit.
5	electric current	**e**	Electric charge at rest, generally produced by friction or electrostatic induction.
6	battery	**f**	The production of a voltage in a coil because of a change in the number of magnetic lines of force (flux linkages) passing through the coil.
7	electromagnetic field	**g**	A basic physical quantity that is a source of electromagnetic fields.
8	electromotive force	**h**	The flow of electrons through a circuit.

3.2 Choose the rightwords in italics to fit into the text about the famous Benjamin Franklin's experiment.

jar batteries charge batteries scale rods natural invisible electricity charge use ascertain motor contribution shock

Benjamin Franklin Kite Experiment

This experiment is one that most of us have heard something about. The most common belief is that the scientist flew a kite into some storm clouds and received an electric shock, discovering electricity. Whilst this is not strictly true, this experiment was a major **(1)** _____ to physics, increasing our

knowledge of **(2)** _____ phenomena.

The first thing to note is that Benjamin Franklin did not discover electricity – the principle was known long before that and primitive capacitors and **(3)** _____ were already in **(4)** _____ by researchers.

Static electricity had been known about for thousands of years, although never fully understood, with most scientists believing that it was an **(5)** '_____ liquid'.

Franklin's contribution was that he believed that lightning was a form of static electricity on a huge **(6)** _____, and designed a number of experiments to try to **(7)** _____ the truth.

After designing experiments with conducting lightning **(8)** _____, which proved to be dangerous, he settled upon using a kite. The idea was to fly the kite into the storm clouds and conduct electricity down the kite string. A key was then attached near the bottom, to conduct the **(9)** _____ and create a **(10)** _____. The kite was struck by lightning and, when Franklin moved his hand towards the key, a spark jumped across and he felt a **(11)** _____, proving that lightning was electrical in nature. The evidence showed that he actually intended for the electricity to jump into a primitive form of capacitor known as a Leyden **(12)** _____ and that touching the key was purely accidental.

Benjamin Franklin was also the first scientist to use the terms positive and negative **(13)** _____. His discoveries led to further research into the nature of electricity, influencing the invention of **(14)** _____ by Volta, and the electric **(15)** _____ by Faraday in the early nineteenth century.

4 LANGUAGE REVIEW

4.1 Analyse the following examples. Derive the general grammar rule to form the Passives.

	Active	Passive
Present Simple	*They often **install** new electrical equipment.*	*New electrical equipment is often **installed**.*
Present Continuous	*They **are installing** new electrical equipment.*	*New electrical equipment **is being installed**. .*
Present Perfect	*They **have installed** new electrical equipment.*	*New electrical equipment **has beeninstalled**.*
Present Perfect	*They **have been installing***	_____

Continuous	*new electrical equipment.*	
Past Simple	*They **installed** new electrical equipment.*	*New electrical equipment **was installed**.*
Past Continuous	*They **were installing** new electrical equipment.*	*New electrical equipment **was being installed**.*
Past Perfect	*They **had installed** new electrical equipment.*	*New electrical equipment **had been installed**.*
Past Perfect Continuous	*They **had been installing** new electrical equipment.*	_____
Future Simple	*They **willinstall** new electrical equipment.*	*New electrical equipment **willbeinstalled**.*
Future Continuous	*They **willbeinstalling** new electrical equipment.*	_____
Future Perfect	*They **will haveinstalled** new electrical equipment.*	*New electrical equipment **willhave beeninstalled**.*
Future Perfect Continuous	*They **will havebeen installing** new electrical equipment.*	_____
Infinitive	*They are going to **install** new electrical equipment.*	*New electrical equipment is going to **be installed**.*
Modals	*They **must install** new electrical equipment.*	*New electrical equipment **must be installed**.*

We form the **Passive** with the auxiliary verb ***to***_____in an appropriate tense form of the active voiceand the _____of the main verb. The Future Continuous, the Present Perfect Continuous, the Past Perfect Continuous and the Future Perfect Continuous are _____normally used in the passive.

Use the rule derived in 4.1 and rewrite the sentences in the Passive.

1 Millions of people use electricity every day to make their daily lives easier.

2 The ways we produce electricity can cause some nasty side effects.

3 The engineers are inspecting all the systems in the ITdepartment.

4 They have ceased the operation of the hydroelectric station to do some maintenance work.

5 The developers will not finish the project by the end of the month.

6 Fossil fuels release pollutants such as carbon, sulfur and ash when they are burnt.

7 They may not deliver the cargo tomorrow.
8 We are going to change the instructions.
9 The company spent a lot of money to build this electrical grid.

4.2 Match the sentences in the Passive to the relevant descriptions.

1	Oil and gas ***are found*** beneath the ground or sea.	**a**	to move important information (the object of the active sentence) to the beginning
2	The results of these two last experiments ***are being taken*** into consideration by the scientists.	**b**	when we want to be impersonal and not mention the name of the person who performs the action (in scientific and technical processes)
3	Repairs ***are being made*** on the runway.	**c**	the action itself is more important than the person who carries it out (as in news headlines, newspaper articles, formal notices, instructions, advertisements, etc)
4	A lot of serious mistakes ***have been made***.	**d**	we refer to an unpleasant event and we do not want to say who or what is to blame (or we want to make statements more polite)
5	The whole area ***was evacuated***. (news report)	**e**	the person, who carries out the action, is unknown, unimportant or obvious from the content

4.3 Read the text choosing the correct option.

Stored Energy and Batteries

Energy ***cannot create /cannot be created*** or ***destroy/destroyed***, but it ***can be saved/can save***in various forms. One way to store it is in the form of chemical energy in a battery. When connected in a circuit, a battery ***produces/is produced*** electricity.

If you ***look/are looked*** at a battery, it will have two ends: a positive terminal and a negative terminal. If you ***connect/are connected*** the two terminals with wire, a circuit ***forms/isformed***. Electrons ***will be flown/will flow*** through the wire and a current of electricity ***produces/is produced***.

Inside the battery, a reaction between the chemicals ***takes/is taken*** place. But reaction ***takes/is taken*** place only if there is a flow of electrons. Batteries ***can store/can be stored*** for a long time and still ***work/are worked*** because the chemical process ***doesn't start/isn't started*** until the electrons ***flow/are flown*** from the negative to the positive terminals through a circuit.

4.4 Presented below are the timelines of scientific inventions. Give the short description of the events in the history of electricity using the passive forms.

1752 By tying a key onto a kite string during a storm, Ben Franklin proved that static electricity and lightning were the same.

_____

_____

1800 Alessandro Volta invented the first electric battery.

_____

_____

1808 Humphry Davy invented the first effective ‘arc lamp.’

_____

1820 Separate experiments by Hans Christian Oersted, A.M. Ampere, and D.F.G. Arago confirmed the relationship between electricity and magnetism.

_____

_____

_____

1821 Michael Faraday invented the first electric motor.

_____

1826 Georg Ohm defined the relationship between power, voltage, current and resistance in ‘Ohm’s Law.’

_____

_____

1831 Using his invention, the induction ring, Michael Faraday proved that electricity can be induced by changes in an electromagnetic field.

_____

_____

1832 Hippolyte Pixii built the first ‘dynamo,’ an electric generator capable of delivering power for industry.

_____

_____

1835 Joseph Henry invented the electrical relay, used to send electrical currents long distances.

_____

_____

1837 Thomas Davenport invented the electric motor.

_____

1839 Sir William Robert Grove developed the first fuel cell, a device that produces electrical energy by combining hydrogen and oxygen.

1841 James Prescott Joule proved that energy is conserved in electrical circuits involving current flow, thermal heating, and chemical transformations.

1844 Samuel Morse invented the electric telegraph.

1860 J.C. Maxwell created a new era of physics when he unified magnetism, electricity and light. Maxwell's four laws of electrodynamics eventually led to electric power, radios, and television.

1876 Charles Brush invented the 'open coil' dynamo (or generator).

1879 Thomas Edison invented an incandescent light bulb.

1883 Nikola Tesla invented the 'Tesla coil', a transformer that changes electricity from low voltage to high voltage making it easier to transport over long distances.

1884 Nikola Tesla invented an electric generator that produces alternating current (AC).

Sir Charles Algernon Parsons invented a steam turbine generator.

1888 Nikola Tesla demonstrated the first 'polyphase' alternating current electrical system.

1897 Joseph John Thomson discovered an electron.

1908 J. Spangler invented an electric vacuum cleaner.

_____

A. Fisher invented an electric washing machine.

_____

1911 W. Carrier developed electric air conditioning.

_____

1923 Albert Einstein received the Nobel Prize for his theories explaining the photoelectric effect.

_____

_____

1947 The scientists of Bell Telephone Laboratories invented a transistor.

_____

_____

1954 World's first nuclear power plant (Russia) started generating electricity.

_____

_____

4.5 Match the rules of the use of adjectives to the relevant sentences.

1	Adjectives describe **nouns.**	**a**	Try to practise English in every ***possible*** situation.
		b	Engineers influence ***different*** aspects of ***modern*** life.
2	Adjectives show what a person thinks of somebody or something (opinion adjectives).	**c**	Heearns a ***good*** wage**.**
		d	I've got a ***valuable*** book as a present.
3	Adjectives give factual information about age, size, colour, origin, material etc. (fact adjectives).	**e**	There is an ***old black*** telephone on the table.
		f	The people are skiing on the ***crisp white*** snow.
4	Nouns are used as adjectives before other nouns.	**g**	Judy wears too much ***eye*** make-up to the office.
		h	Could I borrow your ***telephone*** book for a minute?
		i	I often think of that ***never-ending*** journey.
5	There are compound adjectives formed with	**j**	***broken-down*** washing machine

a) present participle
b) past participle
c) cardinal number + noun

k The reasonof failure was in his ***three-hour*** delay.

6 Adjectives may have difference in meaning.

l He gave her a ***gold*** ring.
(= ring made of gold)
They walked on the ***golden*** sand.
(= sand the colour of gold)

4.6 When there is more than one adjective preceding a noun, they usually go in the following order:

What is it like?	***How big?***	***How old?***	***What shape?***	***What colour?***	***Where was it made?***	***What is it made from?***	***What is it used for?***

Put the adjectives in the corresponding column:

circular	*metal*	*big*	*difficult*	*French*	*lovely*	*flat*	*small*
investment	*cheap*	*old*	*wooden*	*important*	*safety*	*red*	*large*
wonderful	*quiet*	*new*	*plastic*	*American*	*clean*	*black*	

Put each group of words in the best order:

1 long-term contract a legal _____
2 fast new sports a car _____
3 clean a(n) source cheap energy _____
4 package new a(n) software amazing _____
5 chips computer Japanese high-quality _____
6 a(n) large machine old-fashioned cutting _____
7 a(n) investment strategy well-planned _____
8 a(n) American new exciting film _____

4.7 Make compound adjectives to describe the following:

1 a building which has six storeys *a six-storey building*
2 a train which moves fast _____
3 a presentation which is made well _____
4 a report which has twenty pages _____
5 an employee who works hard _____
6 a walk that takes fifteen minutes _____

4.8 Many adjectives have suffixes or prefixes. Some of the more common suffixes are as follows:

• ***-able/ible*** (able to be)
• ***-ful*** (full of, having)
•***-less*** (being without, not having)
• ***-ive*** (tending to, having the nature or quality of doing this)

Complete the following sentences with an adjective formed from one of the verbs or nouns, plus a suffix.

actcare change comfort forge power rely tire truth

1 He never remembers the deadline; I don't know why he's so _____ .
2 The problem is that there's nothing we can do to help with delivery; we're completely _____ .
3 They never seem to run out of energy; they are completely _____ .
4 I believe what he says because he's always been _____.
5 Don't worry. He will prepare all papers in time. He's very _____ .
6 You are always missing something. You are so _____ .
7 Don't rely on him. His plans are so _____ .
8 It's important to keep _____ after you retire.
9 The seats on the plane were very _____ .

4.9 Choose the best word to complete the dialogue. Reproduce the dialogues in pairs.

bestfastest colourdifferent cheapest attractive service free

A: So, Peter, which photocopier do you think we should buy?
B: Well, Xcopy produces the (**1**) _____ model – it costs only £ 599. It has a lot of new features and can do (**2**) _____ copies too. It has an (**3**) _____ design and can do 200 copies in a minute.
A: So which Internet (**4**) _____ provider do you think we should use?
B: Well, BusinessNet is the (**5**)_____. It costs £39 per month and they provide broadband connection and (**6**) _____ upgrades after a year. The service has a lot of (**7**) _____ functions, but the (**8**) _____ connection will cost more. They also offer discounts if we use the service in all our branches. We can register on-line and an engineer will come and install the modem and software the next day.

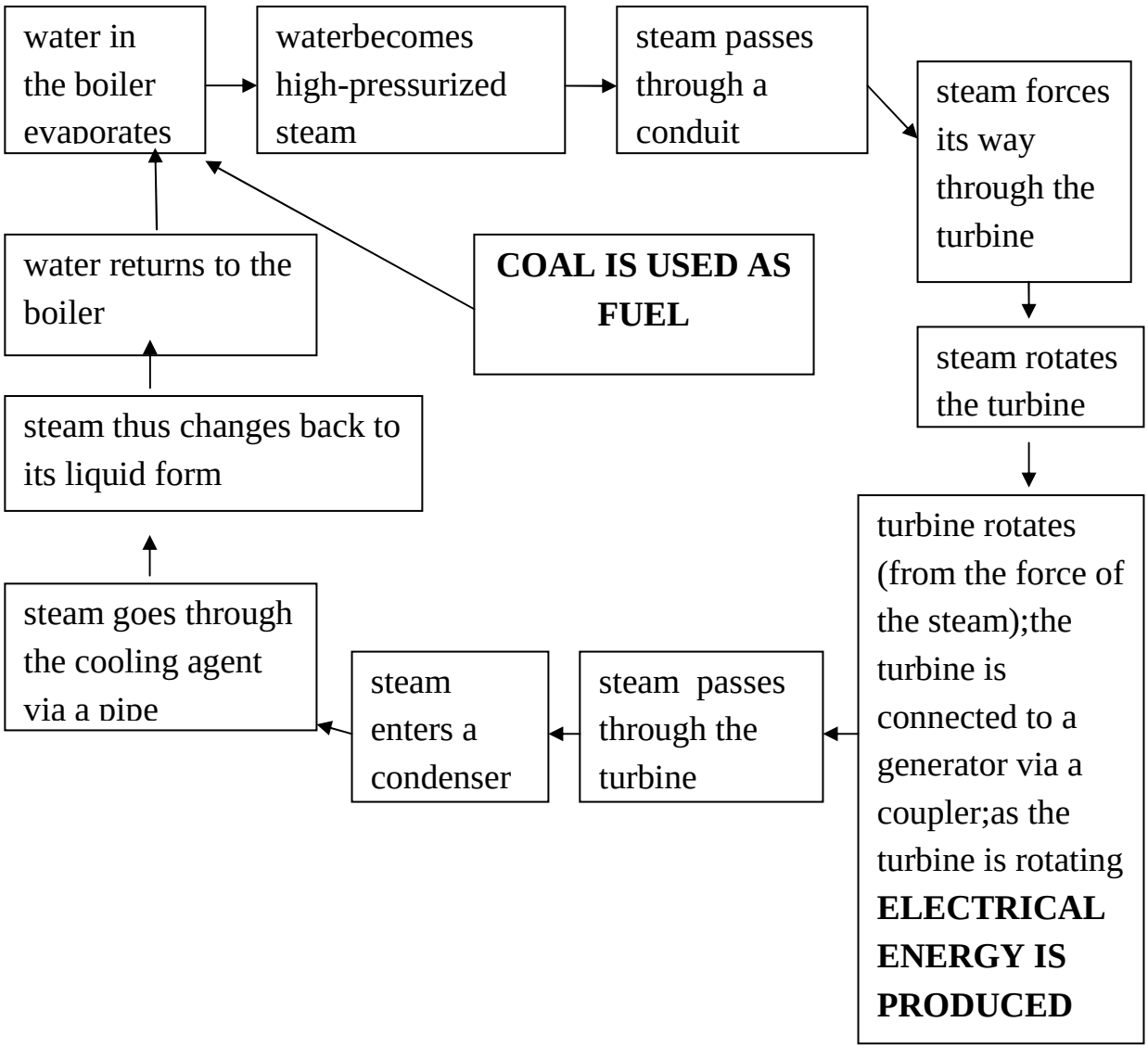
5 SKILLS

DESCRIBING A PROCESS

According to the diagram presented below describe the stages of a thermal power station operation.Use passive structures where possible to describe the process.

Useful words to describe the stages of a process:

To begin with	*Secondly, thirdly, etc.*	*After that*	*Finally*
First of all	*Then*	*Subsequently*	
Firstly	*Next*	*Eventually*	



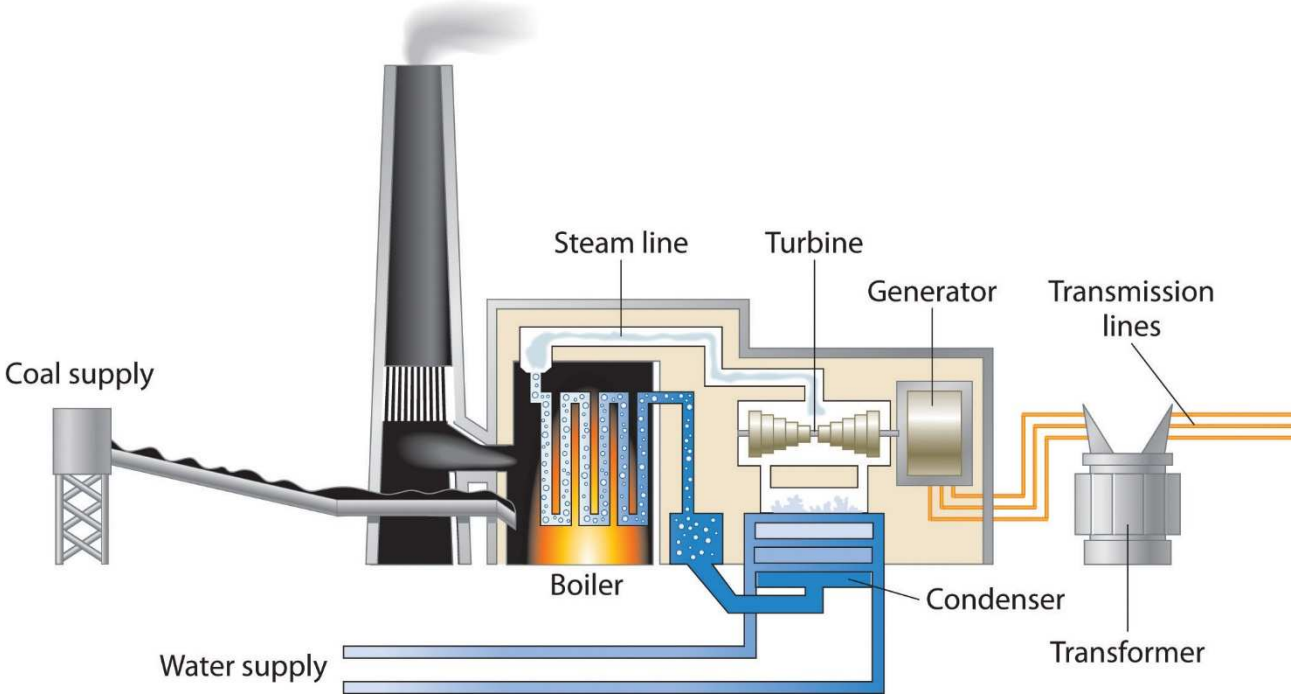


Diagram of a typical steam-cycle coal power plant (proceeding from left to right)

UNIT 11

1 LEAD-IN

1 Do we refer energy to a thing or a condition/state of a thing?
2 What was the first civilization's great energy invention?
3 What are the forms of energy available in nature?
4 Where does energy come from?
5 What do we need energy for?

2 READING

ELECTRICAL ENERGY

(1) The electrical energy supplied by a current to an appliance enables it to do work or provide some other form of energy such as light or heat. Electric power is usually measured in Watts, kilowatts (1,000 watts), and megawatts (1,000,000 watts). The amount of electrical energy used by an appliance is found by multiplying its consumed power by the length of time of operation. The units of electrical energy are usually watt-seconds (joules), watt-hours, or kilowatt-hours. For commercial purposes the kilowatt-hour is the unit of choice.

(2) Electrical energy occurs naturally, but seldom in the forms that can be used. Generally, practical electric-power-generating systems convert the mechanical energy of moving parts into electrical energy. The electric generator is a machine that is used to change mechanical energy into electrical energy. It operates on the principle of electromagnetic induction, discovered (1831) by Michael Faraday. When a conductor passes through a magnetic field, a voltage is induced across the ends of the conductor. The generator is simply a mechanical arrangement for moving the conductor and transmitting the current produced by the voltage to an external circuit, where it actuates devices that require electricity.

(3) While systems that operate without a mechanical step do exist, they are at present either excessively inefficient or expensive because of a dependence on elaborate technology. While some electric plants derive mechanical energy from moving water (hydroelectric power), the vast majority derive it from heat engines in which steam is the working substance. The steam is generated with heat from

combustion of fossil fuels or from nuclear fission.

(4) The conversion of mechanical energy to electrical energy can be accomplished with an efficiency of about 80%. In a hydroelectric plant, the losses occur in the turbines, bearings, penstocks, and generators. The basic limitations of thermodynamics fix the maximum efficiency obtainablethrough converting heat to electrical energy. The necessity of limiting the temperature to safe levels also helps to keep the efficiency down to about 41% for a fossil-fuel plant. Most nuclear plants use low-pressure, low-temperature steam operation, and have an even lower efficiency of about 30%. Nuclear plants have been able to achieve efficiency up to 40% with liquid-metal cooling. It is thought that by using magnetohydrodynamic 'topping' generators in conjunction with normal steam turbines the efficiency of conventional plants can be raised to close to 50%. These devices remove the restrictions imposed by the blade structure of turbines by using the steam or gasses produced by combustion as the working fluid.

2.1 Skim the text and decide which paragraph

__ **a** explains what the electric generator is.
__ **b** gives reasons why the efficiency of power plants is lower than could be expected.
__ **c** indicates the principle the electric generator operates on.
__ **d** mentions how hydroelectric plants derive mechanical energy from the energy of moving water.
__ **e** names the person who discovered the principle of electromagnetic induction.
__ **f** informs about the units used to measure electrical energy.
__ **g** shows the way to increase the efficiency of conventional plants.
__ **h** indicates that electrical energy exists in nature, but in the forms that can hardly be used by a human.

2.2 Read the text and decide if the statements are true (T) or false (F).

1 Electrical energy can be converted into some other form of energy such as light or heat. __
2 Electric power is measured in Amperes. __
3 1 joule is equivalent to 1 watt-second. __
4 As electrical energy occurs naturally, it is almost always in the forms that can be used. __

5 The generator changes mechanical energy into heat energy. __

6 The generator operates on the principle of electromagnetic induction. __

7 The vast majority of electric plants derive mechanical energy from heat engines in which water is the working substance. __

8 The conversion of mechanical energy into electrical energy is accomplished almost without losses. __

2.3 Answer the following questions to the text.

1 How does an electrical appliance work?

2 What does the amount of energy used (or supplied) depend on?

3 What is the unit of electrical power used for commercial purposes?

4 What energy is converted into electrical energy by electric-power-generating systems?

5 Why do most nuclear plants have less efficiency than fossil-fuel or hydroelectric plants?

6 What are the possible ways to increase the efficiency of nuclear plants?

3 VOCABULARY

3.1 Fill in possible derivatives from the following verbs.

verb	*noun*	*adjective*	*person*
supply	_____	_____	_____
accomplish	_____	_____	_____
achieve	_____	_____	_____
remove	_____	_____	_____
restrict	_____	_____	_____
operate	_____	_____	_____
consume	_____	_____	_____
change	_____	_____	_____

3.2 Match the physical quantities with their characteristics.

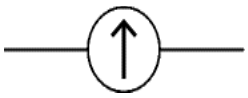
1 current

a – the measure of the energy carried by the charge (‘energy per unit charge’), potential difference
– supplied by the battery (or power supply)
– used up in components, but not in wires
– measured with a voltmeter, connected in parallel
– measured in volts, **V**

2	resistance	**b**	– the rate of using or supplying energy – the symbol for it is **P** – measured in watts, **W**
3	voltage	**c**	– the rate of charge flow – the symbol **I** is used for it in equations – measured with an ammeter, connected in series – measured in amps (amperes), **A**
4	power	**d**	– the property of a component which restricts the flow of electric current – the symbol for it is **R** – is measured in ohms, the symbol for ohm is an omega, Ω
5	capacitance	**e**	– depends on the power and the time for which it is used (Power × Time) – the standard unit for it is the joule (**J**) – it is often measured in kilowatt-hours, **kWh**
6	energy		– the measure of a capacitor's ability to store a charge – the symbol for it is **C** – measured in farads, **F**

3.3 Label the circuit symbols.

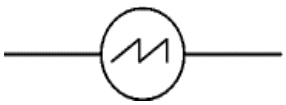
1) _____



2)_____

3)_____

4) _____



5) _____

Voltmeter	–	used to measure voltage
Ammeter	–	used to measure current
Oscilloscope	–	used to display the shape of electrical signals and it can be used to measure their voltage and time period
Galvanometer	–	a very sensitive meter which is used to measure tiny currents, usually 1mA or less
Ohmmeter	–	used to measure resistance

3.4 Choose the right words to fill in the gaps.

commutator poles direct direction rotates alternating circuit coil field

A. In the simplest form of generator the conductor is an open **(1)**_____ of wire rotating between the **(2)**_____ of a permanent magnet. During a single rotation, one side of the coil passes through the magnetic **(3)**_____ first in one direction and then in the other, so that the induced current is **(4)**_____ current (AC), moving first in one direction, then in the other. Each end of the coil is attached to a separate metal slip ring that **(5)**_____ with the coil. Brushes that rest on the slip rings are attached to the external **(6)**_____. Thus the current flows from the coil to the slip rings, then through the brushes to the external circuit. In order to obtain **(7)**_____ current (DC), i.e. current that flows in only one direction, a commutator is used in place of slip rings. The **(8)**_____ is a single slip ring split into left and right halves that are insulated from each other and are attached to opposite ends of the coil. It allows current to leave the generator through the brushes in only one **(9)**_____. This current pulsates, going from no flow to maximum flow and back again to no flow.

dynamo magnets stator alternator driven

B. A practical DC generator, with many coils and with many segments in the commutator, gives a steadier current. There are also several magnets in a practical generator. In any generator, the whole assembly carrying the coils is called the armature, or rotor, while the stationary parts constitute the **(10)**_____. Except in the case of the magneto, which uses permanent **(11)**_____, AC and DC generators use electromagnets. Field current for the electromagnets is most often DC from an external source. The term **(12)**_____ is often used for the DC generator. An AC generator is called an **(13)**_____. To ease various construction problems, alternators have a stationary armature and rotating electromagnets. Most alternators produce a polyphase AC, a complex type of current that provides a smoother power flow than does simple AC. By far the greatest amount of electricity for industrial and civilian use comes from large AC generators **(14)**_____ by steam turbines

4 LANGUAGE REVIEW

4.1 Complete the second sentence so that it has a similar meaning to the first sentence.

1 It is said that nuclear energy is one part of the solution to climate change.
Nuclear energy ***is said to be*** one part of the solution to climate change.

2 It is thought that the project of a new electric greed is short of money.
The project of a new electric greed _____ .

3 The power plant is expected to provide sufficient energy for both domestic and commercial lighting, heating, cooking and industrial processes.
It is expected that _____ .

4 They are said to have built new sewage disposal plants.
It is said that _____ .

5 It is known that in many countries the electric power companies own the whole infrastructure from generating stations to transmission and distribution infrastructure.
In many countries electric power companies _____ .

6 It is reported that the government has reached a compromise with energy suppliers.
The government _____ .

7 Nuclear accidents occurred at the Three Mile Island reactor 2 in the United States and the Chernobyl reactor 4 in the former Soviet Union are thought to be the worst.
It is thought that _____ .

8 It is known that the company is developing a new product at the moment.
The company _____ .

9 They are reported to have financial problems.
It is reported that _____ .

10 Jim is expected to be given a promotion.
It is expected that _____ .

11 It was thought that the plan had been rejected.
The plan _____ .

12 Clean solar energy technologies are said to have huge longer-term benefits.
It is said that _____ .

4.2 Give the comparative and superlative forms of the following adjectives. Use the appropriate forms in the sentences offered below.

modern	_____	_____	flat	_____	_____
big	_____	_____	bad	_____	_____
noisy	_____	_____	expensive	_____	_____
good	_____	_____	common	_____	_____
simple	_____	_____	narrow	_____	_____
long	_____	_____	far	_____	_____
sophisticated	_____	_____	risky	_____	_____
large	_____	_____	powerful	_____	_____

1 This contract was _____ we had ever signed.
2 To achieve an agreement was a bit _____ than we expected.
3 It is one of_____ plants in the region.
4 The project can be even _____ than it is supposed to be.
5 The solar power plant in Crimea is _____ in Europe.
6 Hydropower is the cheapest way and solar cells are probably _____ way to generate electricity.
7 Let's hope there won't be any _____ delays.
8 The results of the last experiments were _____ than the previous ones.
9 It is _____ explanation I have ever heard.

4.3 Rewrite the sentences so that they mean the same. Choose from the following comparative patterns: *much/ much more/ far/ a bit/ a lot/ a little/any* + comparative adjective or *by far* + superlative.

1 She's not nearly as good at problem solving as you.
You are _____ at problem solving than her. (***much***)
2 His idea is slightly more interesting than yours.
Your idea is _____ his. (***a bit***)
3 This system is much better than all the other existing systems of electricity transmission in the world.
This system is _____ in the world. (***by far***)
4 Their installation is a lot more powerful than ours.
Their installation is _____ ours. (***much***)
5 It's not quite as important today as it was yesterday.
It is _____ today than it was yesterday. (***bit***)

6 The equipment we are using now isn't quite as expensive as we used last year.
The equipment we used last year was _____ expensive than the equipment we are using now. (***a little***)

4.4 Put the adjectives in brackets into the comparative or superlative forms.

1 **A:**Will it take much time?
B:No, we'll be there soon. It's not much _____ (***far***).
2 **A:**Do you enjoy your job?
B:Oh, yes. It's _____ (***good***) job I've ever had.
3 **A:**It's very noisy here.
B:Yes, could you speak a little _____ (***loud***)?
4 **A:**Have they built a new substation?
B:Yes. The new one is far _____ (***close***) to this district.
5 **A:**Have you talked to him.
B: Not yet. He is one of _____ (***difficult***) customers I have ever dealt with.
6 **A:**You've spent a lot of money.
B:Exactly so. This system is far _____ (***expensive***) than the old one.
7 **A:**I think Jane is very talented.
B:No one in the team has _____ (***good***) communication skills than Jane.
8 **A:**I'd like to congratulate you.
B:Thanks! It's by far _____ (***successful***) contract we have ever signed.

4.5 Complete the sentences from a newspaper. Use *the +adjective* or *the +adjective+ noun* in brackets (e.g. *the hungry* or *the hungry people*).

- Rich nations can afford to feed ***the hungry*** (***hungry***). (*in general*)
- ***The homeless people*** (***homeless***) whose story appeared in this paper last week have now found a place to live. (*a specific person or a specific group of people)*

1 _____ (***sick***) need to be looked after, so money must be spent on hospitals.
2 Life must be hard for _____ (***unemployed***) in our society today.
3 What is the government doing to help _____ (***poor***)?
4 _____ (***homeless***) usually have great difficulty in getting a job.

5 There is a special television programme for _____ (***deaf***) every Sunday morning.

6 Some of _____ (***young***) at the youth club here are running in a marathon.

4.6 Roger Ball and Angie Fox from the trading company of table lamps are reading a magazine article comparing three types of a famous Tiffani table lamps manufacturer. Study the information and complete their conversation. Reproduce the dialogue in pairs.

Dale Tiffany Traditional Table Lamp - $324.00

Stephen Tiffany Table Lamp - $50.00

Paul Sahlin Tiffany Table Lamp - $167.40

	Dale Tiffany Traditional Table Lamp	***Stephen Tiffany Table Lamp***	***Paul Sahlin Tiffany Table Lamp***
stylish/good looking	••	••••	•••
expensive	••••	••	•••
good/reliable	••••	••	••••
value for money	••••	••	••••

Roger: Well, what do you think of this research, Angie?

Angie: Mm, it's interesting. I think we do quite well, don't we?

Roger: Yes, it says the Dale Tiffany Traditional Table Lampis (**1**) _____ **(*good*)** value for money of the three and that the Paul Sahlin Tiffany Table Lamp is (**2**) _____ **(*good*)** value than the Stephen Tiffany Table Lamp.

Angie: Yes, did you notice that they say the Dale Tiffany Traditional Table Lamp is much (**3**) _____ **(*expensive*)** than the others?

Roger: Yes, they must be true ! However, it does say thatStephen Tiffany Table Lamp is the (**4**) _____ **(*stylish*)**. I was rather disapponted by that.

Angie: Me, too. I think our table lamps are much (**5**) _____ **(*good*)** looking. The thing that worries me the most is our table lamps arenot the (**6**) _____ **(*easy*)** to buy because of high prices.That may put a lot of people off.

Roger: Yes, the Tiffani manufacturerdid very well there due to the design. The shades are of piecis of lighting glass. In fact no two pieces of lighting glass are exactly alike.These differences are not defects, but are simply characteristic of hand crafted stained glass lamps.

Angie: Maybe that appeals to a lot of customers. The Dale Tiffany Traditional Table Lamp is (**7**) _____ **(*expensive*)** and that means it's the (**8**) _____ (***reliable***) too. But it may do extremely (**9**) _____ **(*bad*)** for our sales.

Roger: I'm not glad that the report says the Tiffani table lamps are (**10**) _____ **(*reliable*)**.

Angie: Yes, according to this, the Paul Sahlin Tiffany Table Lamps and Dale Tiffany Traditional Table Lampsare our (**11**) _____ **(*strong*)** rivals. The Stephen Tiffany Table Lamp can't really compete.

5 SKILLS

PRESENTING AND COMPARING FACTUAL INFORMATION

According toInternational Hydropower Association these are the most powerful hydroelectric power stations in the world. Make a short presentation comparing their capacities.

THE MOST POWERFUL HYDROELECTRIC POWER STATIONS IN THE WORLD

Hydroelectric Power Stations	Name	Country	Capacity, Megawatts	Year
	The Three Gorges	China	18,200	2009

	Itaipu	Brazil, Paraguay	12,600	1983
	Guri	Venezuela	10,000	1986
	Grand Coulee	USA	6,494	1942
	Sayano-Shushenskaya, Yenisey river	Russia	6,400	1989
	Krasnoyarsk, Yenisey river	Russia	6,000	1968 - 1972
	Churchill Falls	Canada	5,428	1971

UNIT 12

1 LEAD-IN

1 What are the main categories of electricity users?

2 How much electricity does a typical household use?

3 How does electricity produced at power plants get to the customers?

4 Is electricity transmitted mainly through overhead lines or underground cables?

5 Is wireless energy transfer possible?

2 READING

2.1 Scan the text and choose the best headline for the text.

1 Modern Transformers

2 Transmission of Electrical Energy

3 New Technologies in Developing Power Grids

Electrical energy is of little use unless it can be made available at the place where it is to be used. To minimize energy losses from heating of conductors and to economize on the material needed for conductors, electricity is usually transmitted at the highest voltages possible. As modern transformers are virtually loss free, the necessary steps upward or downward in voltage are easily accomplished. Transmission lines for alternating current using voltages as high as 765,000 volts are quite common. For higher voltages it is advantageous to transmit direct current rather than alternating current. Recent advances in rectifiers, which turn alternating current into direct current, and inverters, which convert direct current into alternating current, have made possible transmission lines that operate at 800,000 volts and above. Such lines are still very expensive, however.

Electric utilities are tied together by transmission lines into large systems called power grids. They are thus able to exchange power so that a utility with a low demand can assist another onewith a high demand to help prevent a blackout, which involves the partial or total shutdown of a utility. Under such a system theutility experiencingtoo great load, as when peak demand coincides with the equipment failure, must remove itself from the grid or endanger other

utilities. During periods in which demand exceeds supply a utility can reduce the power drawn from it by lowering its voltage. These voltage reductions, which are normally of 3%, 5%, or 8%, result in power reductions, or brownouts, of about 6%, 10%, or 15%, causing inefficient operation of some electrical devices. The power distribution system, because of its generation of low-frequency electromagnetic fields, has been suggested as a possible source of health problems.

The grid is an electricity network supporting all or some of the following four distinct operations: electricity generation, electric power transmission, electricity distribution and electricity control. It may be used to refer to an entire continent's electrical network, a regional transmission network or may be used to describe a subnetwork such as a local utility's transmission grid or distribution grid.

Electricity in a remote location might be provided by a simple distribution grid linking a central generator to homes. The traditional paradigm for moving electricity around in developed countries is more complex. Powergeneration plants are usually located near a source of water, and away from heavily populated areas. They are usually quite large in order to take advantage of the economies of scale. The electric power which is generated is stepped up to a higher voltage—at which it connects to the transmission network. The transmission network transmits the power over long distances — sometimes across international boundaries—until it reaches its wholesale customer (usually the company that owns the local distribution network). Upon arrival at the substation, the power will be stepped down in voltage—from a transmission level voltage to a distribution level voltage. As it exits the substation, it enters the distribution wiring. Finally, upon arrival at the service location, the power is stepped down again from the distribution voltage to the required service voltage.

This traditional centralized model with its distinctions is breaking down with the introduction of new technologies. For example, the characteristics of power generation can in some new grids be entirely opposite of those listed above. Generation can occur at low levels in dispersed locations, in highly populated areas, and not outside the distribution grids. Such characteristics could be attractive for some locales, and can be implemented if the grid uses a combination of new design options such as net metering, electric cars as a temporary energy source, or distributed generation.

2.2 Skim the text and choose the correct option.

1 To minimize energy losses electricity is usually transmitted at the _____

a lowest voltages.

b average.

c highest voltages.

2 A rectifier is an electrical device that _____

a increases current flow.

b converts alternating current to direct current.

c convertsdirect current to alternating current.

3 An inverter is an electrical power converter that _____

a changes direct current to alternating current.

b step up the voltage.

c changes alternating current to direct current.

4 An electrical grid is _____

a an interconnected network for delivering electricity from consumers to suppliers.

b a generating station that produces electrical power.

c a network of electric utilities connected by transmission and distribution lines and operated by one or more control centers.

5 Generating plants are usually built _____

a in densely populated areas.

b not far from each other.

c quite far from heavily populated areas.

6 When the power comes to the substation, it is _____

a stepped down in voltage.

b stepped up to a higher voltage.

c transmitted further in the same voltage.

2.3 Answer the following questions to the text.

1 Why is usually electricity transmitted at high voltages?

2 What voltages is alternating current transmitted at?

3 What current is advantageous to transmit for voltages higher than 765,000 volts?

4 What do power grids provide?

5 What happensto a power grid utility when it experiences too great load?

6 What does the voltage reduction result in?

7 What are the functions of a power grid?

8 How is a remote location provided with electricity?

9 What is the traditional way of transmitting the electricity?

10 How is the traditional centralized power transmitting model changing nowadays?

3 VOCABULARY

3.1 Find words or phrases in the text which mean the same as the following:

1 an industrial facility for the generation of electric power _____

2 the bulk transfer of electrical energy, from generating power plants to electrical substations located near demand centres _____

3 transmission lines interconnected with each other _____

4 the local wiring between high-voltage substations and customers _____

5 the electrical potential difference or electric tension _____

6 an electrical device that converts alternating current to direct current _____

7 a short- or long-term loss of the electric power to an area _____

3.2 Fill in the gaps with the corresponding word forms.

noun (person)	*noun(phenomenon)*	*verb*	*adjective*
conductor	_____	_____	_____
_____	_____	transmit	_____
user	_____	_____	_____
_____	_____	_____	alternating
_____	equipment	_____	_____
_____	_____	operate	_____
generator	_____	_____	_____
_____	_____	distribute	_____
_____	introduction	_____	_____
_____	_____	implement	_____

3.3 Use the words given in capitals at the end of some of the lines to form a word that fits in the same line.

New Material Could Eliminate Loss in Electrical Power Transmission

(1)_____ at Riken Advanced Science Institute and the University of Tokyo have demonstrated a new material that they claim could eliminate loss in electrical power **(2)**_____ . The team's method for solving this energy problem is based upon the first **(3)** _____ of an exotic type of magnetic semiconductor first theorised less than a decade ago – a magnetic topological **(4)**_____ .	RESEARCH TRANSMIT REALISE INSULATE
The work is **(5)**_____ related to the quantum Hall effect, which is known to produce **(6)**_____ electricity channels but requires large, cumbersome magnets to produce fields 100,000 larger than the earth's **(7)**_____field for its operation.	CLOSE DISSIPATION MAGNET
To overcome this, the researchers used the exotic type of semiconductor which exhibited a similar effect known as the quantum **(8)** _____ hall effect. This stems from the semiconductor's own **(9)** _____ rather than from an external one.	ANOMALY MAGNETIZE
At the heart of this effect is the **(10)** _____ between magnetic ions and the **(11)**_____ insulator's current carrying particles, known as Dirac fermions, which are unique because they behave as if they have zero mass.	INTERACT TOPOLOGY
Although the method **(12)**_____ requires cryogenic conditions, the team hopes that **(13)** _____ in material design will make **(14)**_____ possible at higher temperatures.	CURRENT IMPROVE OPERATE

4 LANGUAGE REVIEW

4.1 Match the patterns of comparison on the left with the relevant descriptions on the right.

1	This ball is **as big as** the other ball.	**a**	Compare three or more things →***superlative degree***.
2	This ball is **bigger than** the other ball.	**b**	Compare two things, which are the same →***positive degree***

3 This ball is **the biggest of** them all. **c** Compare two things with each other →***comparative degree***

4.2 Use either *as … as* or *not as/so … as* in the sentences below.

1 This copy is bad. The other one is bad too.
The other copy is _____ this one.

2 Their expectations concerning the possibilities of reducing power consumption are more optimistic than ours.
Our expectations concerning the possibilitiesof reducing power consumption are _____ theirs.

3 The airport is always crowded. That day it was crowded as well.
The airport was _____ ever.

4 Gold is heavier than silver.
Silver is _____ gold.

5 The previous decision was spontaneous. This one is the same.
This decision is _____the previous one.

6 They seemed to be cleverer.
They are _____ they seemed to be.

7 The old production line was efficient. The new one is equally efficient.
The new production line is _____ the old one.

8 When I was going to a business trip, I expected the hotel would be comfortable. It is not very comfortable.
The hotel is _____ I expected.

9 I had thought the meeting was long. It was really long.
The meeting was _____ I thought.

10 The first task iscomplicated. The second task is also complicated.
The second task is _____ the first one.

4.3 Complete the sentences with *'the … the'* choosing the appropriate pairs of adjectives.

longer/ more difficult	***more sophisticated/ better***
better/ greater	***more complicated /greater***
newer/ more expensive	***more comfortable/ higher***

1 _____ the discussion goes on, _____will be to find a solution.

2 _____ equipment is used, _____ results you can get.

3 _____ hotel you book, _____ payment will be.

4 _____ problem you have to solve, _____ diversity of options you have to take into consideration.

5 _____ your education is, _____ opportunities you will have in your career.

6 _____ the car is, _____ it is.

4.4 Complete the sentences with one of the adjectives in italics and the *comparative +and + comparative* pattern.

profitable experienced dangerous loud comfortable tired

1 As I was working at the computer, I was getting _____ .

2 As she works hard, she is becoming _____ .

3 They are constantly increasing the load, so the experiment is becoming _____ .

4 Their productivity is increasing, so they are becoming _____ .

5 They changed the layout and bought new furniture, so their office is becoming _____ .

6 As we were launching more machines, the noise was getting _____ .

4.5 Complete the sentences with *so, such, too* and *enough*.

1 It was _____ late to stop the experiment at the power plant.

2 She was _____ young but she got _____ a promotion.

3 We were _____ disappointed when the experiment failed.

4 They were smart _____ to pass the test.

5 It was _____ an interesting idea that it was really worth considering.

6 He was _____ busy to talk to the customer.

7 He wasn't strong _____ to lift that heavy box.

8 Don't be _____ impatient. We'll find a solution.

9 The information in the report is interesting _____ to start a new discussion.

10 The rent is _____ expensive that I have to look for some other accommodation.

11 We have to stop our work because it was _____ dark.

12 This is _____ difficult for me to understand.

4.6 Choose the correct adjective in the following sentences. Mind that adjectives ending in *–ing* describe something we are reacting to, while adjectives ending in *–ed* describe our feelings and reactions.

1 You look ***worrying/worried***. What happened?
2 I don't think our partners like the idea. They look ***bored/boring***.
3 The new project seems to be ***exciting/excited***.
4 The report is too long. It sounds ***bored/boring***.
5 The meeting was very ***interested/interesting***.
6 I was particularly ***interesting/interested*** in what they promised.
7 This time I am really ***puzzled/puzzling***.I can't explain their reaction.
8 Your proposal sounds really ***disappointed/disappointing***.

4.7 Complete the paragraph with the positive or comparative forms of the adjectivesin italics.

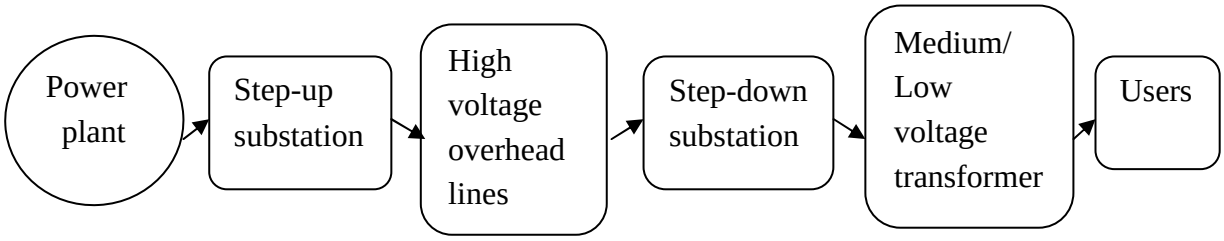
cheap	***fast***	***difficult***	***easy***
clever	***important***	***up-to-date***	***essential***

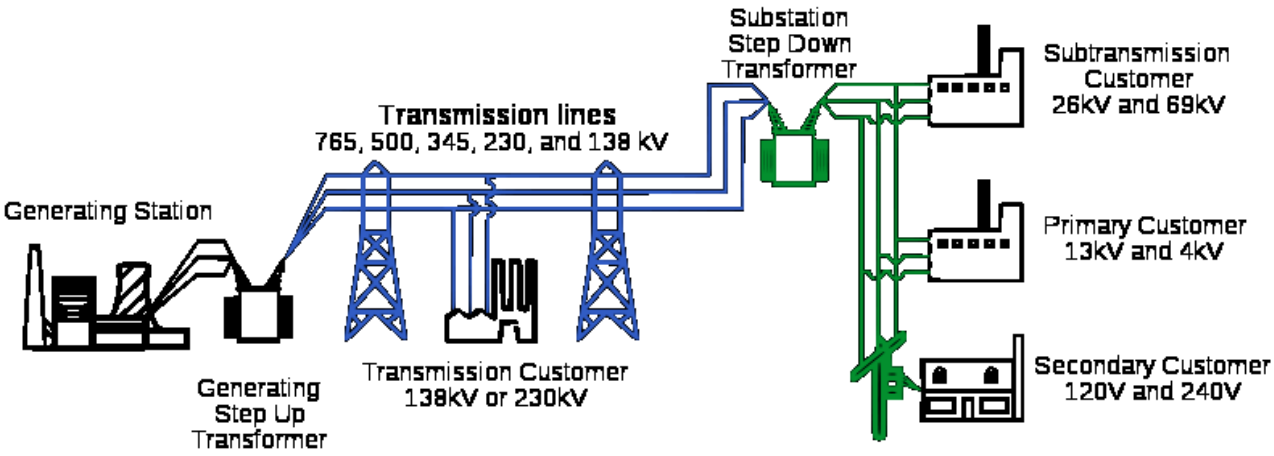
Nowadays using computers is more and more **(1)** _____ . We can't do without them, and you don't have to be an expert to use one, as using a computer is **(2)** _____and_____ all the time. You don't need to be reach either, as computers are also becoming **(3)** _____ and _____ as time goes on. Also, if you are studying, the Internet is becoming more and more **(4)** _____ as a place to find information. This used to take a long time, but the latest machines are a great improvement. The **(5)** _____ the computer, the _____ it works. However, protecting computers from viruses is becoming more and more **(6)** _____ as the people who invent viruses are becoming **(7)** _____ and _____ . The Internet has become a dangerous place, so it is more and more **(8)** _____to be very careful when we use computers.

5 SKILLS

PRESENTING DIAGRAMS

Use the diagram, schematic diagram and sentences presenting different stages of electrical energy transmission to describe the transfer of electrical energy from generating power plants to electrical substationslocated near demand centers.





A power plant produces electrical energy of medium (20,000 V) or low (1,000) voltage.

A step-up substation elevates electrical power produced at a power generation plant to high voltage (up to 400 kV).

Electrical power is transmitted across long distances by high-tension power lines to reduce the energy losses.

A step-down substation converts the high voltage back down medium voltage and then electrical power can be transmitted through medium voltage overheard lines or underground cables to feed medium and lowvoltage transformers

Most of the users are supplied with electrical power of low voltage, but bigger consumers, such as factories, commercial buildings, hospitals and so forth, can be directly supplied with the electrical power of medium voltage.

USEFUL LINKING WORDS

to begin*initially, first, at first, firstly, to start/begin with, first of all*

to continue*secondly, after this/that, second, afterwards, then, next*

to conclude*finally, lastly, in the end*

UNIT 13

1 LEAD-IN

1 Comment on the quote from the site of Exelon Corporation (the USA) striving for the highest standards of power generation, delivery and wholesale marketing and having a broad range of environmental initiatives.

'We're providing energy today,and protecting the environment fortomorrow.'

2 Work in small groups. Make a list of possible environmental impacts that can be the result of electricity generation and transmission. Take into consideration the following factors:

- the effects of obtaining the fuels from mines
- the effects of using the fuels
- dealing with the wastes
- the effects of using renewable energy sources
- waste heat generated by an electric-power plant and not converted into electrical energy
- the effects of electricity transmission

2 READING

ENVIRONMENTAL IMPACT OF ELECTRICITY GENERATION AND TRANSMISSION

(1) All energy conversion methods used to produce electricity have some environmental impact. The impact may have an active effect like the emission of airborne pollutants, or may have a passive effect like aesthetics or habitat modification. Even methods considered environmentally friendly have some impact on the environment. Fossil fuel power plants generally have the most widespread effect on the environment, as the combustion process produces airborne pollutants that spread over a wide area. Nuclear power plants have the most potentially dangerous effect. An operating accident at a nuclear station could allow for a large release of radioactive particles to occur. Solar, hydro, and wind power plants generally have smaller effects on the environment.

(2) The whole cycle of electricity generation must be considered when looking at the environmental impact. This includes the production and transportation of fuel for the conversion process. This is especially true of fossil fuel and nuclear power plants, which use large quantities of fuel mined from the earth. Energy system environmental impact consists of fuel recovery and

production, fuel transportation, electricity transmission, and spent fuel emissions.

(3) Fossil fuel power plants produce environmental problems including land and water use, air emissions, thermal releases, climatic and visual impacts from cooling towers, solid waste disposal, ash disposal (for coal), and noise. Due to the need for large amounts of steam, plants can have a great effect on water use. The biggest effect fossil fuel plants have overall is the emission of air pollutants, particularly SOX, NOX , CO, CO2 , and hydrocarbons. Carbon monoxide, CO, carbon dioxide, CO2, and the hydrocarbons are the 'greenhouse gases,' believed to be responsible for global warming. SOX and NOX produce acid when released into the atmosphere, leading to the production of acid rain.

(4) Nuclear power plants have one environmental issue no other form of electrical power plant does. An accident at a nuclear power plant may release large amounts of radioactive particles, possibly resulting in a direct loss of life, and rendering a large land area immediately around the plant unlivable. The largest environmental impact is the disposal of the huge amounts of nuclear waste contained in spent fuel rods, as this waste must be stored safely for thousands of years. A long term issue is the decommissioning of nuclear power plants. Decommissioning is shutting down a nuclear plant after its operational life is over. At this point the entire reactor vessel becomes a high level radioactive waste that must be disposed. The current methods of decommissioning a plant are to completely remove and dispose of all radioactive components, to entomb the reactor in concrete, or simply to shut the plant down and restrict access until the radioactivity dies out.

(5) The generation of electricity from solar energy sources generally has a small effect on the environment. There are no residuals produced in the energy conversion process. The only exception is solar thermal processes, which have an operating fluid that must occasionally be discharged. There are some environmental concerns, however. Bulk solar plants generally require a large land area, and they produce a great deal of heat. An unknown quantity in solar energy is the disposal of photovoltaic cells. The most promising solar cells use gallium arsenide, a toxic substance.

(6) The use of hydropower to produce electricity can have both positive and negative effects on the environment. At some sites, a dam may help with flood control, flow regulation, or the reservoir may provide recreational opportunities. At other sites, the dam may have adverse effects on the

hydrological cycle, water quality of the stream, stream ecology, fish migration, and cause the destruction of landscapes and ecosystems. Low-head dams generally have a benign effect on the environment. Dam failures can lead to catastrophic floods.

(7) Wind generators biggest environmental effects come from visual pollution, noise, and TV interference. This is particularly true of wind farms, where 50 or more wind turbines may be mounted at the same site. Wind farms situated on a migratory path may pose major hazards to birds. There is also a safety hazard in case of blade breakage.

(8) Not only does the final production of electricity have an environmental impact. The transmission of electricity with concerns over electromagnetic fields, aesthetics, and land use, also impacts the environment. Traditionally transmission lines have been viewed only as an aesthetic nuisance that could cause communications interference and be a hazard to low flying aircraft. Today, greater concern is placed on the effect of the lines on the natural habitat. The major new issue is the effect of electromagnetic fields (EMFs) on human health. More than 1,000 studies have been performed since 1979 to assess the relationship between low frequency magnetic fields and human health. Most of the research has focused on the relationship between cancer rates and fields produced in the 50-60 Hertz range used for electricity transmission. The studies generally focus on children with residential exposure to high voltage transmission lines, or workers with high degrees of occupational exposures to EMFs. One difficulty in the studies is estimating the amount of EMF exposure a person receives.

(9) The heat generated by an electric-power plant that is not ultimately converted into electrical energy is called waste heat. The environmental impact of this waste is potentially catastrophic, especially when, as is often the case, the heat is absorbed by streams or other bodies of water. Cooling towers help to dispose waste heat into the atmosphere.

2.1 The text is divided into nine sections. Scan the text and decide which headline is appropriate to each paragraph.

1 __ Positive and Negative Effects of Hydropower.

2 __ Environmental Problems Caused by Fossil Fuel Power Plants Operation.

3 __ Negative Effects under the Use of Solar Energy Sources.

4 __ Environmental Impact at the Stage of Fuel Production and Transportation.

5 Potential Danger of Wind Generators.

6 __ Waste Heat Generated by an Electric Power Plant.

7 __ Potential Environmental Impact ofthe Energy Conversion Methods Application.

8 __ Environmental Impact of Electricity Transmission Lines.

9 __ The Potential Danger at the Stages of Nuclear Plants Operation and Decommissioning.

2.2 Use the information from the text to complete the following sentences.

1 All energy conversion methods used to produce electricity, even those that are considered to be environmentally friendly, have _____ .

2 Estimating the environmental impact, we have to take into consideration _____ including _____ .

3 Energy system environmental impact embraces _____ .

4 Among environmental problems caused by fossil fuel power plants are _____ .

5 The emissions of some air pollutants like _____ are believed to be responsible for _____ .

6 Any accident at a nuclear power plant may release large amounts of radioactive particles that results in _____ .

7 The disposal of the high level nuclear waste is another problem, as _____ .

8 In spite of the fact that the production of electricity from solar energy sources generally has a small effect on the environment, there are some environmental concerns, because _____ .

9 Though the use of hydropower to produce electricity can have some positive effect on the environment, among the adverse ones are _____ .

10 Wind farms environmental effects can come from _____ .

11 Having been viewed traditionally only as an aesthetic nuisance, transmission lines have some adverse effect on the natural habitat, as _____ .

12 Waste heat, that is the heat generated by an electric-power plant and not ultimately converted into electrical energy, can be another problem, because _____ .

2.3 Answer the following questions to the text.

1 What are the active and passive environmental effects of the energy conversion methods?

2 What power plants are known to have the most widespread effect on the environment?

3 Why are the nuclear power plants considered to be the most dangerous?

4 What power plants are supposed to have smaller environmental impact?

5 Why does the operation of fossil fuel power plants influence water use?

6 What is the most vigorous effect of fuel power plants?

7 What is the largest regular environmental impact of nuclear power plants operation?

8 What are the current ways of nuclear power plants decommissioning?

9 What are the negative effects of solar plants?

10 What are the adverse effects of hydropower use?

11 How do wind farms interfere with the environment balance?

12 Why is it important to take into consideration the transmission lines operation?

3 VOCABULARY

3.1 Find the words with opposite meanings and use them in the sentences of your own.

1	active	**a**	irregular
2	environmentally friendly	**b**	narrow
3	dangerous	**c**	negative
4	wide	**d**	passive
5	positive	**e**	adverse
6	regular	**f**	safe

3.2 Match the following words from the text to make up word partnerships.

1	energy	**a**	modification
2	environmental	**b**	plants
3	fossil	**c**	pollutants
4	waste	**d**	conversion
5	electricity	**e**	rain
6	global	**f**	friendly
7	fuel	**g**	gases

8	transmission	**h**	effects
9	habitat	**i**	emissions
10	greenhouse	**j**	warming
11	adverse	**k**	lines
12	acid	**l**	impact
13	environmentally	**m**	disposal
14	airborne	**n**	fuels
15	power	**o**	generation

3.3 Use the appropriate word partnerships from 3.2 in the following sentences.

1 Radioactive _____ _____ practices have changed substantially over the last twenty years. The designs for new facilities and methods must meet environmental protection and pollution prevention standards that are stricter than were foreseen at the beginning of the atomic age.

2 _____ _____ is the transformation of one type of energy into another.

3 In 2006, about 15% of global _____ _____ was through nuclear, 16% through hydro, 68% through fossil fuels (coal, oil, natural gas), and less than 1% through renewables (solar, wind, tidal).

4 _____ _____ such as coal and gasoline provide most of the energy needs of the world today, but because of their diminishing reserves, high prices and most importantly, their damaging effect on the environment, alternative sources of energy and _____ _____ fuels are now being developed.

5 All modern countries are crisscrossed with high-voltage _____ _____, which transport electrical power from generators at power plants to substations and ultimately consumers.

6 The _____ _____ of electricity generation is significant because modern society uses large amounts of electrical power.

7 Electrical power is normally generated at _____ _____ that convert some other kind of energy into electrical power.

4 LANGUAGE REVIEW

4.1 Match the types of adverbs to the relevant sentences with adverbs.

1	adverbs of **manner**	**a**	He is ***always*** coming late.

		b	It was very strange to make changes when ***almost***half of the work has been done.
2	adverbs of **degree**	**c**	He looked at me ***angrily***.
		d	There is a new factory ***nearby***.
		e	It was ***slightly*** cheaper than we expected.
3	adverbs of **frequency**	**f**	He ***easily*** passed all the exams.
		g	The accident happened***yesterday***.
		h	They decided to meet***here*** again.
4	adverbs of **place**	**i**	The new office will be ready ***in two months***.
		j	He did not work hard, ***therefore***, he failed.
5	adverbs of **time**	**k**	I came here a year ago. ***Previously***, I lived in New York.
		l	***Possibly***, they will give some discount.
6	adverbs of **opinion**	**m**	We are ***eagerly*** waiting for signing this contract.
		n	They are talking ***outside***.
7	adverbs of **reason**	**o**	***Consequently,*** he refused to come.
		p	They ***often*** go on business abroad.
		q	***No doubt***, they will increase their profit.

4.2 Examine the following table. Mind the position of adverbs in the sentence. Underline all types of adverbs and translate the sentences into your native language.

Front position	*Mid position*	*End position*
Finally he could stand the noise no longer.	We ***almost*** missed our way.	He worked in the room ***quietly***.

1 I expect him to arrange the deal easily.
2 He greatly regretted signing the document.
3 I secretly hated making presentations.
4 She kindly offered to do the work.
5 I don’t pretend to understand instructions completely.
6 As a result, Japan faces energy crises.
7 Tomorrow the results will be much better.
8 We considered the probable results briefly.
9 I first came here in 1995.

10 Next, add three teaspoons of sugar.

4.3 Use the adverbs in brackets in the correct position.

1 Our partners must reduce the costs. (***also***)
2 I was trying to explain the reason of our delivery delay. (***only***)
3 Did you enjoy the flight? (***both***)
4 They invite any consultants. (***hardly***) (***ever***)
5 He drives his car. (***carefully***)
6 The directors of all departments are discussing a new project. (***in the conference room***)
7 We signed the contract with a new supplier. (***yesterday***)
8 John destroyed all the plans. (***almost***)
9 We'll change our equipment. (***probably***)
10 Our head office is moving to Stockholm soon. (***definitely***)
11 He couldn't stand the noise any longer and decided to leave. (***finally***)

4.4 Place the adverbs in the correct position in each line to complete the passage.

A	Hi! Thanks for your last e-mail. I'm sorry I haven't	***very***
	got back to you sooner but we've been rushed	***terribly***
	in the office. We seem to be so busy.	***always***
	It seems the launch has been successful,	***remarkably***
	beyond our wildest dreams in fact. We are delighted	***obviously***
	and we have had a large order from a company	***already***
	in China. This is fabulous news. See you soon.	***absolutely***
B		
	Thank you for the e-mail you sent. I have spoken to Eric	***yesterday; already***
	but he says he is waiting for confirmation from the board	***still***
	before we can go ahead with the proposed changes. The delay	***quite frankly***
	is getting on my nerves but I hope to get started on the project.	***very soon***
	As is the case, we will receive confirmation at the last	***often; suddenly***
	minute and have to work for the next couple of months	***flat out***
	in order to get into production.	***fast***

4.5 Write the adverbs formed from the following adjectives.

surprising, wide, soft, public, good, fast, right, easy, late, careful, quick, heavy, probable, wrong, systematic, noisy, possible, near, straight, lazy, hopeful, energetic, simple, hard

-ly	*surprisingly,*_____
-le → -ly	_____
consonant+y →-ily	_____
-ic → -ally	_____
the same form	_____
totally different form	_____

4.6 Identify the adjective or the adverb in each sentence, as in the example.

1 They ***slowly*** left the office. (adverb)

2 It is ***easy***to make a mistake in calculations if you are in a hurry.

3 The task was very ***difficult*** and they needed some extra time.

4 They have been working very ***hardrecently***.

5 The test was ***surprisinglyeasy***.

6 They examined all the drawbacks ***carefully***.

7 She is ***anxiously*** waiting for the reply to her inquiry.

8 They are very ***polite*** to their clients.

9 He is a***friendly*** person.

4.7 There is a difference in meaning between the following pairs of adverbs:

hard *= with effort*	***hardly*** *= scarcely*
near *= close*	***nearly*** *= almost*
late *= not early*	***lately*** *= recently*
high *= at a high level*	***highly*** *= very*
free *= without charge*	***freely*** *= without restraint*

Underline the correct option.

1 They live very ***near/nearly*** to the head office.

2 He ***near/nearly*** crashed his car last week.

3 There were so many people in the exhibition hall that we could ***hard/hardly*** hear what the presenter was saying.

4 We tried ***hard/hardly*** to reduce our expenses, but we couldn't do it. The new installation was very expensive.

5 He came to the meeting ***late/lately***.

6 I haven't seen him ***late/lately***.

7 They speak English ***free/freely***.

8 They got this tester ***free/freely***with a magazine.

4.8 Choose the correct item.

1 He ***correct/correctly*** defined the terms.
The answer sounded ***correctly/correct***.

2 She ***quickly/quick*** adjusted the fees.
She adapted ***quick/quickly*** to any situation.

3 He measured the floor of the assembly shop ***exact/exactly***.
They proved to be ***perfectly/perfectexact/exactly*** measurements.

4 It was a ***dangerously/dangerous*** place to work.
The gas smelled ***dangerously/ dangerous***.

5 It was an ***easy/easily*** course but he did not pass the course as ***easy/easily*** as he thought he would.

6 The mechanic's tools were ***well/good***.
The foreman said that his work was ***good/ well*** done.

7 I find this idea very ***interesting/interestingly***.
It was ***interesting/interestingly*** presented.

8 Andrea is a ***good/well***specialist.
She always knows the material very ***good/well***.

9 You must send payments ***regular/regularly***.
We deal on a ***strictly/strict*** cash basis.

4.9 Fill in the blank with the correct comparative form of the adverb in brackets.

1 The French delegation arrived _____ than expected. ***(early)***

2 She speaks English _____ than the other presenters. ***(slowly)***

3 They promised to call us _____ . ***(late)***

4 My mother and my sister talked _____ than the other guests. ***(loudly)***

5 Now he is working even _____ than before. ***(hard)***

6 They answered the questions _____ than the other contestants. ***(fast)***

7 The hotel was located _____ from the city centre than that they stayed during their first visit to their subsidiary. ***(far)***

8 She performed her duties _____ than the other executives. ***(well)***

9 The new manager explains the scheme of work _____ . ***(badly)***

10 The new mechanic checked the car _____ than the old mechanic. ***(thoroughly)***

4.10 Read the conversation between colleagues. Complete it with the comparative and superlative forms of the words in brackets. Add *the* and *than* where necessary.

Billy: Did you hear about that new speed-typing course? It helps you type (**1**) _____ (***fast***) and (**2**) _____ (***well***).

Michael: I don't believe it! The (**3**) _____(***fast)*** you type, the (**4**) _____ (***many***) mistakes you make.

Billy: The advert says that after the course, you'll type ten times (**5**) _____ (***rapidly***) and can do five times more typing. And the best thing is that you won't have to work any (**6**) _____ (***hard***).

Michael: I'd like to see that. Not long ago I typed (**7**) _____ (***slowly***) of any colleague in my office and I remember that my practice (**8**) _____ (***clear***).

Billy: Maybe you could type even (**9**) _____ (***quickly***) that . That way, you'd have more time to do your paperwork.

Michael: Did you read the course description (**10**) _____ (***proper***)?

Billy: I read it (**11**) _____ (***thoroughly***) I read most things.

4.11 Complete each sentence using the correct adverb of degree. Sometimes either word is possible. Consult the following scheme.

____ • ____ •• ____ ••• ____ •••• ____

fairly ***quite*** ***rather/pretty*** ***very***

1 The film was _____ good but the book was much better.

2 We were _____ pleased with the hotel room but _____ disappointed with the service.

3 The examination test was _____ difficult, so we were not able to answer almost half of the questions.

4 I could not believe what had happened. It was _____ amazing.

5 John is a hard worker but he is _____ slow.

6 The people I work with are _____ unfriendly.

7 It is well-paid but it is _____a hard job.

8 Our guest speaks German _____ well.

9 I've made a _____ stupid mistake.

10 It was a _____ boring reporton the company's activity.

5 SKILLS

GIVING A PRESENTATION

The environmental impact of electricity generation is significant because modern society uses large amounts of electrical power. This power is normally generated at power plants that convert some other kind of energy into electrical power. Each such system has advantages and disadvantages, but many of them pose environmental concerns.

In small groups speculate on and debate the issues of electricity generation. Use the facts mentioned in the text in the READING part, the prompt ideas below and express your opinion being persuasive and logical. Decide who will insist on pros or be against ideas.

POSITIVE	NEGATIVE
• Electrical energy is consideredto be the most convenient form of energy.. It could be converted from one form into any other form.	• The consumption of fossil fuel resources affects the planet's atmosphere and leads to global warming and climate change.
• The running of the modern industrial structure depends on the low cost and the uninterrupted supply of electricity. A country is developed if per capita consumption of electrical energy is much higher.	• The main concern over hydroelectric power is the environmentalimpact of building the dam itself. Creating the reservoir in turn creates an ecosystem, but stops the river flowing further downstream.
• The machines or devices which works on electrical energy can easily be controlled with the help of electric devices such as regulators, voltage controllers etc.	• The chief environmental concern is the unknown affects the turbines may have on the marine ecosystem.

- It is very easy to carry electricity from one place to other by using conductors.

- Electrical energy is much cheaper compared to other forms of energy.

- In recent years there has been a trend towards the increased commercialization of various renewable energy sources.

- The transmission efficiency of electrical energy is much higher.

- Rapid advance of technology can improve the practice of energy transmission, water and waste management, and food production without the harm to environment.

- Energy conservation can be achieved by increasing efficient energy use, in conjunction with decreasing in energy consumption and/or reducingtheuse of conventional energy sources.

- The turbine blades affect the environment on the ground, which is not ideal from a green standpoint.

- Solar power is very expensive and current cell production levels are typically inadequate for modern electricity consumption.

- Nuclear powergeneration entails nuclear wastes, which is hazardous and difficult to dispose of. The main social concern is safety. Although nuclear accidents are incredibly rare, they are potentially damaging.

USEFUL PHRASES

Opinions, preferences

I think...,
In my opinion...,
I'd like to...,
I'd rather...,
I'd prefer...,
The way I see it...,
As far as I'm concerned...,
If it were up to me...,
I suppose...,
I suspect that...,
I'm pretty sure that...,
It is fairly certain that...,
I'm convinced that...,
I honestly feel that…,
I strongly believe that...,
Without a doubt...

Disagreeing

I don't think that...,
I don't agree…,
I'd prefer...,
Shouldn't we consider...,
But what about...,
I'm afraid I don't agree...,
Frankly, I doubt if...,
Let's face it…,
The truth of the matter is...,
Don't you think it would be better...,
The problem with your point of view is that...

Giving reasons and offering explanations

To start with…,
The reason why...,
That's why...,
For this reason...,
That's the reason why...,
Many people think....,
Considering...,
Allowing for the fact that...,
When you consider that…

UNIT 14

1 LEAD-IN

1 What are the main two types of energy resources?

2 What is the difference between sources of energy and energy resources?

3 Group the following energy sources into nonrenewable and renewable:

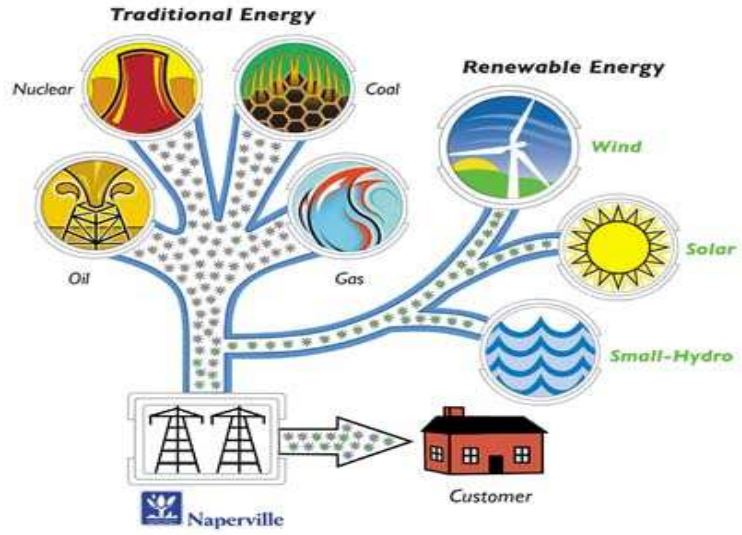
- oil (petroleum)
- biomass
- geothermal
- solar
- coal
- natural gas
- hydropower
- wind
- uranium (nuclear)

4 In small groups discuss the advantages and disadvantages of the energy sources mentioned above. Compare your opinion with the ideas of the other groups.

2 READING

ENERGY RESOURCES

1) _____



Energy is the vital force powering business, manufacturing, and the transportation of goods and services to serve the world economies. Energy supply and demand play an increasingly vital role in the national security and the economic output of any nation. It is not surprising that annually governments spend huge amounts of money on energy.

Most of our energy comes from fossil fuels. They are fuels formed by natural resources such as anaerobic decomposition of buried dead organisms. The age of the organisms and their resulting fossil fuel is typically millions of years, and sometimes exceeds 650 million years. Fossil fuels range from volatile materials with low carbon: hydrogen ratios like methane, to liquid petroleum and nonvolatile materials composed of almost pure carbon, like anthracite coal. In fact, the earliest known fossil fuel deposits are from the Cambrian Period about 500 million years ago, before the dinosaurs emerged

onto the scene. This is when most of the major groups of animals first appeared on Earth. The later fossil fuels — that provide more substandard fuels like peat or lignite coal (soft coal) — began forming as late as five million years ago in the Pliocene Period. At our rate of consumption, these fuels cannot occur fast enough to meet our current or future energy demands.

Although the supplies of fossil fuels are vast, they are limited. What is more important, the earth's atmosphere and biosphere may not survive the environmental impact of burning such enormous amounts of these fuels. Carbon stored over millions of years is being released over decades, disrupting the earth's carbon cycle in unpredictable ways.

(2) _____

But fossil fuels are not the only source of energy, and burning fuel is not the only way to produce heat and motion. Renewable energy offers us a better way. Some energy sources are 'renewable' because they are naturally replenished, because they can be managed so that they last forever, or because their supply is so enormous that they can never bedepleted by humans. Moreover, renewable energy sources have much smaller environmental impacts than fossil and nuclear fuels.

Renewable energy is energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished).

(3) _____

The sun is our most powerful source of energy. Sunlight, or solar energy, can be used for heating, lighting and cooling homes and other buildings, generating electricity, water heating, and a variety of industrial processes. Most forms of renewable energy come either directly or indirectly from the sun. For example, heat from the sun causes the wind to blow, contributes to the growth of trees and other plants that are used for biomass energy, and plays an essential role in the cycle of evaporation and precipitation that makes hydropower possible. A twentieth-century technology is photovoltaic, which turns sunlight directly into electricity.

Wind is the movement of air

that occurs when warm air rises and cooler air rushes in to replace it. The energy of the wind has been used for centuries to sail ships and drive windmills that grind grain. Today, wind energy is captured by wind turbines and used to generate electricity.

Water flowing downstream is a powerful force. Water is a renewable resource, constantly recharged by the global cycle of evaporation and precipitation. The heat of the sun causes water in lakes and oceans to evaporate and form clouds. The water then falls back to Earth as rain or snow, and drains into rivers and streams that flow back to the ocean. Flowing water can be used to power water wheels that drive mechanical processes. And captured by turbines and generators, like those housed at many dams around the world, the energy of flowing water can be used to generate electricity.

(4) _____

Biomass has been an important source of energy ever since people first began burning wood to cook food and warm themselves against the winter chill. Wood is still the most common source of biomass energy, but other sources of biomass energy include food crops, grasses and other plants, agricultural and forestry waste and residue, organic components from municipal and industrial wastes, even methane gas harvested from community landfills. Biomass can be used to produce electricity and as fuel for transportation, or to manufacture products that would otherwise require the use of nonrenewable fossil fuels.

Hydrogen has tremendous potential as a fuel and energy source, but the technology needed to realize that potential is still in the early stages. Hydrogen is the most common element on Earth — for example, water is two-thirds hydrogen — but in nature it is always found in combination with other elements. Once separated from other elements, hydrogen can be used to power vehicles,replace natural gas for heating and cooking, and to generate electricity.

The heat inside the Earth produces steam and hot water that can be used to power generators and produce electricity, or for other applications such as home heating and power generation for industry. Geothermal energy can be

drawn from deep underground reservoirs by drilling or from other geothermal reservoirs closer to the surface.

(5) _____

The ocean provides several forms of renewable energy, and each one is driven by different forces. Energy from ocean waves and tides can be harnessed to generate electricity, and ocean thermal energy — from the heat stored in seawater — can also be converted to electricity. Using up-to-date technologies, most ocean energy is not cost-effective compared to other renewable energy sources, but the ocean remains important potential energy source for the future.

(6) _____

Nuclear power harnesses the heat of radioactive materials to produce steam for power generation. It is generated using uranium, which is a metal mined in various parts of the world. Nuclear power produces around 11% of the world's energy needs, and produces huge amounts of energy from small amounts of fuel, without the pollution that you'd get from burning fossil fuels.

(7) _____

Despite the promise of alternative energy sources — more appropriately called renewable energy — collectively they provide only about seven percent (7%) for the world's energy needs. This means that fossil fuels, along with nuclear energy — a non-renewable energy source — are supplying 93% of the world's energy resources. In most areas, the demand for electricity increases each year but supply often does not match this demand, forcing energy prices to climb. Perhaps the best solution to our growing energy challenges comes from The Union of Concerned Scientists: 'No single solution can meet our society's future energy needs. The solution instead will come from a family of diverse energy technologies that share a common thread — they do not deplete our natural resources or destroy our environment.' (*Eric McLamb*)

2.1 Match the headings (a – g) with the paragraphs (1 – 7) in the text.

a Sources of Energy Used for Centuries.

b Examples of Multiple Renewable Energy Uses.
c Non-Renewable Energy Source.
d General Facts about Fossil Fuels.
e Finding a Better Solution for Our Energy Needs.
f Not Cost-Effective Forms of Renewable Energy Sources.
g General Sources of Renewable Energy.

2.2 Read the text again and for sentences 1–4 choose the best answer *a, b, c* or *d.*

1 Solving the energy problem is crucial because energy

a providesthe national security of any country.
b has been used for centuries.
c serves the world's economy.
d meets people's demand.

2 The potential of fossil fuels

a can't be substituted by a new substance which components can be engineered to develop fuel.
b is closely connected with environmental issues.
c is limited and not enough to solve the world's energy problem.
d doesn't currently dominate the global energy system.

3 Most forms of renewable energy

a are always found in combination with other forms of energy.
b come either directly or indirectly.
c do not match our demand in it.
d come from deep underground reservoirs.

4 Renewable and nonrenewable energy sources

a are used in the world's economy in equal shares.
b can be exhausted but no push exists to find more solutions.
c provide the major part of energy resources in the world's economy.
d must be chosen carefully for ourselves and for the generations to come.

2.3 Decide and match which quality refers to which energy resource?

1	themost powerful source of energy	**a** ___	nuclear power
2	produces energy without the pollution	**b** ___	hydrogen

3	has a powerful force and is a renewable source of energy	**c**	___	the sun
4	one of the most common sources of biomass energy	**d**	___	water
5	its potential is still not fully realized	**e**	___	biomass
6	potential commercial power sources	**f**	___	wind
7	gets energy from varying temperatures	**g**	___	fossil fuels
8	are formed from volatile and nonvolatile materials	**h**	___	waves, tides and ocean

3 VOCABULARY

3. 1 Find words or phrases in the text which mean the same as the following:

1 energy which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are naturally replenished _____

2 fuels formed by natural processes such as anaerobic decomposition of buried dead organisms _____

3 natural resources which cannot be reproduced, grown, generated, or used on a scale which can sustain their consumption rate, once depleted they are no more available for future needs _____

4 organic chemicals that have a high vapor pressure at ordinary, room-temperature conditions (their high vapor pressure results from a low boiling point, which causes large numbers of molecules to evaporate or sublimate from the liquid or solid form of the compound and enter the surrounding air) _____

5 an accumulation of sediments, mineral ores, coal, etc. _____

6 not capable of being predicted _____

7 any form of water that falls to the earth's surface _____

8 providing adequate financial return in relation to outlay _____

3.2 Complete the statements with the appropriate word.

A ***deplete — depletion — depletable — depleted***

1 Ozone _____ is the human destruction of the ozone layer. This can come from greenhouse gases, given off by factories, cars, and electricity usage.

2 Our supplies of food are rather _____ .

3 If we continue to _____ the Earth's natural resources, we will cause serious damage to the environment.

4 Most energy resources currently in use are non-renewable. They are also called _____ resources.

B ***destroy — destruction — destructive***

1 Changes to water systems may increase the frequency and severity of _____ floods.

2 The Tibetan plateau is at the stage of ecological _____ due to extensive mineral extraction, deforestation and unscientific construction of highways and railways.

3 Various human activities threaten to disrupt the balance and_____ the world's ecosystems.

C ***solution — solve — unsolved***

1 We can _____ our energy problems by learning how the world really works.

2 Technical progress remains the effective _____ to the ecological threats such as global warming and pollution.

3 The problems of poverty and racism seem to be _____ in many developed countries.

D ***demand (v) — demand (n) — demanding***

1 They _____ an urgent review of the existing control system.

2 He has been working at a nuclear power plant for almost ten years. His job is really_____ .

3 I have heard about their _____ for higher pay.

E ***produce — producer(s) — production — productive — productivity***

1 The_____ forces express people's active relationship with nature.

2 The selection of electricity _____ modes and their economic viability varies in accordance with demand and region.

3 Increasing _____ is one of the most critical goals in business.

4 The ability of major petroleum _____ to withhold the supply reveals the importance of energy independence and price.

5 Nuclear power plants can _____ a huge amount of power from a single unit.

4 LANGUAGE REVIEW

4.1 Match the modal verbs and substitute phrases with their functions in a sentence and translate the sentences into your native language.

1	__	Everyone ***must*** obey the law.	**a**	necessity (somebody else other than speaker has made the decision)
2	__	We ***have to*** wear uniform at work.	**b**	obligation less strong than ***must***
3	__	I've made the decision. I ***must*** take all the responsibility.	**c**	prohibition
4	__	You ***mustn't/can't*** park here.	**d**	lack of necessity
5	__	You ***needn't/don't need to/don't have to*** attend these meetings.	**e**	necessity (the speaker decides that something is necessary)
6	__	People ***should/ought to*** respect each other.	**f**	it wasn't necessary for you to do, but you did
7	__	You ***needn't have*** phoned them, they had been informed beforehand.	**g**	duty/obligation

4.2 Rephrase the following sentences using *must, mustn't, needn't, have to, should/ought to, needn't have, didn't to/didn't have to.*

1 You are obliged to inform the engineer about the the increase of the electrical load.

_____

2 You aren't allowed to enter this area.

_____

3 It wasn't necessary to check up the figures, so all the papers were sent immediately.

_____

4 It is getting late,soit's the right thing to postpone the meeting.

_____

5 It is not necessary to spend any more time on this work. I'll take care of it myself.

_____

6 It is the right thing to consider the consequences before taking any important decision.

_____

7 I can't come and see you, because I am obliged to go to our branch in Spain. My boss says so.

_____

8 It isn't necessary for you to attend tomorrow's staff meeting.

_____

9 Why did you change the time constraints for this project? It wasn't necessary as we had enough time.

_____

10 It is forbiddento throw litter on the site.

_____

4.3 Look through the Personnel Manager's notes and write down the whole sentences to explain the company rules.

Obliged	be on time at work; leave the building in case of emergency (fire, etc.)
Necessary	sign the attendance book
Not necessary	wear formal clothes on Fridays (casual Fridays)
Prohibited	park cars in front of an emergency exit; smoke in the office building
Good idea	speak to the heads of the departments about excessive hours; give notice to the heads of the departments about holidays; inform the manager if you have to leave work earlier
Bad idea	take days off very often; leave personal things at working places

4.4 You are given the answer to a question. Make the question using *have to* and the question words provided.

1 – What time _____?
– He has to get to the office at 8:00.

2 – Where _____?
– You have to sign your name at the bottom of the last page of your contract.

3 – Who _____?
– He has to get in touch with the General Manager.

4 – Why _____?
– She had to leave early because she had an appointment.

5 – How long _____?
– They have had to wait for the reply to their letter of complaint for two weeks.

6 – Whom _____?
– She had to meet the chief designer at the airport.

7 – When _____?
– I'll have to finish this draft by tomorrow.

8 – How long _____?
– We have had to make corrections for at least a couple of hours.

4.5 Complete the comment on the situation with either *didn't need to* or *needn't have.*

1 I worked hard and finished my report on time, but our manager has given us two more days.
_____ ?

2 The bus arrived in time last night, so it wasn't necessary for me to take a taxi.
_____ ?

3 It was my day off yesterday, that's why it was not obligatory for me to get up early.
_____ ?

4 I spent a lot of time using the Internet unnecessarily.
_____ ?

5 I managed to finish this work on my own, and I didn't ask for any help.
_____ ?

6 I worried about this visit a lot, but this was not necessary.
_____ ?

7 When I came to the office on Sunday to prepare the papers for tomorrow meeting I discovered that the secretary had already prepared them.
_____ ?

8 We arrived at the airport very early and found out that the plane was late.
_____ ?

9 We went to a restaurant and the boss paid for the food.
_____ ?

10 It was my day off yesterday, but I got up early.
_____ ?

5 SKILLS

PROBLEM SOLVING ACTIVITY

'It's not hard to make decisions when you know what your values are.'

Roy Disney

OBJECTIVES:

- to understand the reasons of an appropriate nuclear power station location
- to define the advantages and disadvantages of nuclear power

Look through the factors that have to be taken into consideration when a nuclear power plant is to be built and the principal directions of the UK policy as to the perspectives of nuclear energy use. On the basisof the information onthe case study, estimate the reasonabilityfor building a new nuclear power plant on the site. Give your reasons for the decision.

Nuclear power plants are mainly located

- in coastal locations (cast amount of cooling water can be extracted from the sea and returned when it has been used);
- where the geology can provide firm foundations (reduces the risk of earth movements damaging the reactor and supports the weight of the reactor);
- where there is a large amount of low value flat land or where land is easily reclaimed (reduces costs);
- away from major centres of population (the public perceives the risk of leaks or accidents to be less and so there is less opposition to the construction of power plants).

The UK relies on atomic energy for nearly 20% of its electricity. No reactors have been built since the 1980s, due to

- concerns about accidents;
- spiraling decommissioning costs;
- the problem of nuclear waste.

The government has renewed its support for nuclear power because of

- soaring oil and gas prices;

– dwindling fossil fuel reserves;
– pressure to tackle the problem of climate change.

CASE STUDY

Heysham Power Station, Lancashire Heysham Power Station is a nuclear power station located in Heysham, Lancashire, England. The site is divided into two separately-managed stations, Heysham 1 and Heysham 2, both of the advanced gas cooled reactor (AGR) type, with two reactors each. On 18 October 2010 the British government announced that Heysham was one of the eight sites it considered suitable for future nuclear power stations.

- Morecumber is the nearest largest settlement, opposition was not very strong.
- The site was undeveloped and so therefore cheap (low value land).
- The underlying rock is firm sandstone.
- It has a coastal location where it can extract cooling water and later return it. Heysham is on Morecumber Bay.
- The west coast rail route is close to the power station, so uranium can be transported easily to Heysham and spent fuel rods can be transported too.

UNIT 15

1 LEAD-IN

1 When were fuels (gas, coal, and oil) formed underground from plant and animal remains?

2 What do we use fossil fuels for nowadays?

3 What human-made conversions or transformations do natural sources undergo?

4 What industrial facilities produce electric power?

5 Surf the Internet for the information about main fossil fuel reserves (coal, oil, gas) as on the current year (and the number of years we expect them to last).

2 READING

TRADITIONAL SOURCES OF ENERGY

By the middle of the 18th century, much of Europe was experiencing an energy crisis due to lack of timber. As a result, coal became the major source of fuel. Coal was a plentiful source of energy. It is still very abundant. At the current rate of use, coal will last another 200 years and represents about 78% of the world's available fossil fuels. It can be found in many countries around the world. One of the main uses of coal is in the generation of electricity. 38% of the world's electricity is generated by coal. Even though coal is a very abundant energy supply there are concerns about its role in pollution.

Oil has been used as a source of energy for thousands of years. Sumerians, Assyrians and Babylonians used crude oil that seeped out of the ground along the Euphrates river for lighting and medicine. The Dead Sea in Israel was once called Lake Asphaltites, petroleum used to wash up on the shores.

Unrefined petroleum was already in use around 5,000 years ago. The ancient Persians used it for lighting and

medicinal purposes. The Chinese used skimmed oil for lighting for a long time. Oil has shaped our global civilisation through its plentiful and cheap supply so far. Oil and gas together constitute over half of the world's energy supply. But oil supplies are in decline in 33 out of the 48 largest oil producing countries.

Natural gas is mostly methane. Again, most scientists agree that natural gas was also created from plant matter, perhaps at the mouths of rivers where this plant matter could not be converted to coal. Some methane gas however originates in the primeval gas cloud that formed the solar system. Therefore it is not solar in origin.

Gas is a cleaner energy source than oil or coal. Its global demand is projected to grow at 2.8% annually up to 2025. This rate is greater than that for oil. However, the infrastructure for the distribution of gas makes it an expensive form of energy.

The use of natural gas also stretches into antiquity. Where natural gas seeped to the Earth's surface, lightning strikes would sometimes light these gas flows. Hence the temple of the ancient Greek Oracle of Delphi was built around such a flame. The Chinese, around 500 BC were the first gas entrepreneurs. They used bamboo as pipelines to transport gas. The British first commercialised this resource and by 1785 they used it to light street lamps and homes. The Americans were the first to build the first long pipeline in 1891. It carried natural gas to Chicago from wells in central Indiana.

People have used fossil fuels as energy sources for a long time. The Aztecs and Romans in Britannia used coal for heating. Nowadays fossil fuels are used for a myriad of purposes, fitting within the following categories: residential use, commercial use, uses in industry, transportation, generation of electricity. The advantages of fossil fuels as energy sources have been their abundance, a wide variety of derivative products, plastics for example, relatively cheap production costs, ease of distribution and use in various combustion technologies.

Fossil fuels are still valuable as well. But the use of fossil fuels to generate electricity has side effects. Fossil fuels burning creates carbon dioxide, the number one greenhouse gas contributing to global warming. Combustion of

these fossil fuels is considered to be the largest contributing factor to the release of greenhouse gases into the atmosphere. In the 20th century, the average temperature of Earth rose by one degree Fahrenheit (1°F). This was the period of the most prolific population growth and industrial development in the history of the Earth. The impact of global warming on the environment is extensive and affects many areas. In the Arctic and Antarctica, warmer temperatures are causing the ice to melt that will cause the sea level increase and a change in the composition of water in the surrounding seas. Sea levels rising affects people's lives in coastal zones, brings a lot of harm to agriculture and fishing. Air pollution is also a direct result of the use of fossil fuels, resulting in smog and the degradation of human health and plant growth.

There is also a great danger to natural ecosystem due to the mining fossil fuels and particularly to that of coal and oil. Oil spills have devastated ecosystems and coal mining has stripped lands of their vitality.

In spite of all the factors mentioned above, fossil fuels will probably continue to be significant energy sources for decades to come. Increased demand for them presents huge political, social and environmental problems. Further exploration for fossil fuels is continuing. The growing prices on their mining demand for the use of new technologies to extract oil and gas where it was costly not long ago. These technologies allow for the exploration in deep ocean water, previously inaccessible. As prices increase these technologies may also allow for the production of hydrocarbons from oil sands and shale. Shale is a fine-grained, dark brown or black rock containing oil deposits. After all, the latter is believed to have greater energy potential than all the oil of Saudi Arabia. Until our renewable energy sources become more viable as major energy providers, the only alternative for our global population is for these companies to continue tapping into the fossil fuel reserves to meet

our energy needs.

2.1 Read the text and underline the sentences that best describe the pictures.

2.2 Read the text again and for sentences 1– 5, choose the answer *a, b, c* or *d* which you think fits best.

1 There are concerns about the role of coal in pollution

a as far as we use it to generate energy.

b because its combustion results in many side effects.

c as people have used it as energy source for a long time.

d because carbon dioxide is the number one greenhouse gas.

2 Over half of the world's energy supply

a is used for a myriad of purposes.

b is seeped out of the ground.

c is provided by oil and gas.

d is projected to grow at fast rate.

3 The first pipelines to transport gas

a had relatively cheap production costs.

b were already in use around 5,000 years ago.

c could be found in many countries around the world.

d were made from bamboo and used by the Chinese entrepreneurs.

4 The British first commercialization of gas in 1785 meant

a it would last more than 200 years.

b using it in various combustion technologies.

c making it available to buyers.

d its advantages for using in technological processes.

5 Further exploration for fossil fuels is going to continue in the nearest future

a because of the alternative energy sources intensive use.

b because fossil fuel reserves meet our energy needs.

c because newtechnologies allow for the exploration in deep ocean water, previously inaccessible.

d due to lack of timber.

2.3 Decide which words and word combinations refer to which category. Match four entries in each category.

extraction	oil sands and shale	primeval gas cloud	global warming
medical purposes	combustion	plant matter	heating
conversion to coal	degradation of human health and plant growth	lighting streets and homes	air pollution and smog
seeping out of the ground	generation of electricity	rising sea levels and oil spills	a wide variety of derivative products

The origin of fossil fuels	**The purpose of fossil fuels uses**	**The consequences of fossil fuels uses**	**Technological and natural processes dealing with fossil fuels**
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3 VOCABULARY

3.1 Fill in the following words. Make up sentences based on the text, using the completed phrases.

	greenhouse	***global***	***oil***	***energy***	***natural***		
	energy	***current***	***fossil***	***global***	***plentiful***		
1	_____	crisis		**6**	_____	ecosystems	
2	_____	source		**7**	_____	gases	
3	_____	rate		**8**	_____	spills	
4	_____	supply		**9**	_____	civilisation	
5	_____	warming		**10**	_____	Fuels	

3.2 Here are the words from the text related to fossil fuels. Group them under the headings. Which of them are international words i.e. the same in many languages? Find in the text other words to make partnerships with these adjectives.

viable	***collect***	***abundant***	***release***	***unrefined***	***available***
crude	***convert***	***contribute***	***significant***	***skimmed***	***generate***
shape	***extract***	***unrefined***	***expensive***	***constitute***	***consider***

verbs	**adjectives**
_____	_____
_____	_____
_____	_____

3.3 Choose the right words in italics to fit into the passage about fossil fuel resources.

lack	***burning***	***cheaper***	***consumed***	***nonrenewable***	***experienced***
	However	***cleaner***	***depleted***	***available***	***Throughout***

Fossil fuels are a (**1**) _____ resource. They are used in the production of energy, and have been (**2**)_____ at increasing rates in recent history. Fossil fuels include coal, natural gas, and oil. All three of these are (**3**) _____ in a fixed supply, and are being rapidly (**4**)_____ .

The first major use of fossil fuels began during the Industrial Revolution in the 18th century. (**5**) _____, it took until the beginning of the 20th century for coal to replace wood as the dominant source of fuel for the new industrial economy.

Coal took over because it became much easier and (**6**) _____ to mine, and it was a better source of energy than wood. Within ten years, oil and natural gas replaced coal. These fossil fuels are (**7**) _____ than coal, and easier to transport. Also, oil can be used when liquid fuel is needed.

In the 1970s, the world and especially the US (**8**) _____ serious fossil fuel shortages. When OPEC* put an embargo against the United States, many people began to conserve energy and realize the effects of a (**9**) _____ of fossil fuels.

In 1984, the three major fossil fuels accounted for 82% of the world's commercial energy production. In the US, 91% of the energy supply came from

(**10**) _____ those fossil fuels.

(**11**) _____ the history of industrialization, major changes have occurred. In the beginning, the industrializing countries used substances such as wood that were available locally to generate energy. Now, by contrast, the developed countries rely on fossil fuels that are transported to them.

[*] *OPEC – Organization of the Petroleum Exporting Countries*

4 LANGUAGE REVIEW

4.1 Match the modal verbs and substitute phrases with their functions in sentences and translate the sentences into your native language.

1	__	He ***can/is able to*** work with this applied software.	**a**	ability in the past (singlepast action); managed to do
2	__	We ***can't/aren't able to*** help you with the delivery.	**b**	negative logical assumption
3	__	I ***could/was able to*** run fast when I was young.	**c**	ability in the present
4	__	It was very difficult, but we ***were able to*** find the solution.	**d**	positive logical assumption
5	__	We ***couldn't/weren't able to*** reach him on the phone.	**e**	ability in the past (past repeated action)
6	__	They ***can't be*** in the office. I have just seen them leaving.	**f**	lack of ability in the past (didn't manage to do)
7	__	They ***must be*** working out this plan.	**g**	probability, expectation
8	__	Susan ***should***/***ought to*** be in New York by now.	**h**	lack of ability at presenter future

4.2 Complete the sentences with *can, can't, could, couldn't* or *be able to.*

1 I don't think we'll _____ to change the terms of the contract.

2 Sorry, I _____ see you next week, but I'll phone you when I come back and we'll make the arrangements.

3 If you _____ place your order today, we we'll _____ ship by Tuesday.

4 She finds German very difficult. She _____ understand it, but she _____ speak it.

5 I _____ play tennis well when I was in my twenties, but now I'm out of practice.

6 I'm sorry I _____ take your invitation, because I'm up to my eyes in work.

7 Will you _____ go to the client and sort out the problem?

8 The deal broke down, as we _____ agree on the price.

4.3 Study the examples where *must* and *can't* are used to make assumptions and then complete the sentences using the appropriate form of modals.

I'm sure he is the Chief Executive.	He ***must be*** the Chief Executive.	**present infinitive**
I'm sure he isn't a Sales Manager.	He ***can't be*** a Sales Manager.	
I'm certain they are developing a new electric power grid.	They ***must be developing*** a new electric power grid.	**present continuous**
I'm sure they won't be discussing this issue tomorrow.	They ***can't be discussing*** this issue tomorrow.	**infinitive**
I'm certain they have found a new partner.	They ***must have found*** a new partner.	**perfect infinitive**
I'm certain they didn't get in touch with the supplier.	They ***can't have got*** in touch with the supplier.	
I'm certain they have been waiting for your decision too long.	They ***must have been waiting*** for your decision too long.	**perfect continuous infinitive**
I'm certain he hadn't been trying hard.	He ***can't have been*** **trying** hard.	

1 I'm certain they started their working day early on Monday.
*They **must have started** their working day early on Monday.*

2 I don't think she has been working for this company long.
She _____

3 I'm sure they have spent all their money on this new software.
They _____

4 Sue is very responsible. I'm sure Sue wasn't driving carelessly when the accident happened.
Sue _____

5 I'm certain they haven't changed their mind.
They _____

6 I'm certain they hadn't paid the bill for electricity.
They _____

7 I'm sure she has got a pay rise.
She _____

8 I'm sure the Production Manager is seeing a new client.
The Production Manager _____

5 SKILLS

PRACTISING INTERVIEW TECHNIQUES

A reporter of an*Energy Now*magazine presenting the critical energy issues is interviewing Mr John Milton, a specialist in the field of traditional energy sources. Complete the interview developing the appropriate questions and applying the interview techniques to make the programme interesting to the viewers.

Interviewer: The guest of our today's programme is Mr John Milton, an expert in the field of traditional energy sources. We really appreciate your coming here today, Mr Milton. Today we are going to talk about energy resource that for years has been referred to as the 'black diamond.'

J. Milton: Yes,coal has long been a highly exploited resource for basic energy. This is because of the numerous advantages of coal energy.

Interviewer: _____**?**

J. Milton: Coal is easily available, easy to transport and store, versatile in use and an economic source of energy.

Interviewer: _____**?**

J. Milton: Coal is available in abundance around the globe, unlike oil and natural gas, which are available in only certain pockets of the world.

Interviewer: _____**?**

J. Milton: To use coal, you just mine it and use it. That is the biggest advantage of coal over other resources of energy like oil and natural gas, which need a lengthy process of refining before they are available for use by consumers.

Interviewer: _____**?**

J. Milton: The abundance of resource, easy accessibility and cheaper mode of transportation makes coal a cheaper form of energy. Electricity produced from coal turns out to be cheaper than electricity produced from other nonconventional sources such as solar and wind, or even nuclear.

Interviewer: _____?

J. Milton: Coal based powerdoes not depend on weather what cannot be saidabout alternative forms of renewable energy such as wind or solar power.

Interviewer: _____?

J. Milton: Transporting coal does not require the upkeep of high-pressure pipelines and there is no requirement for extra security when transporting coal.

Interviewer: _____?

J. Milton: The coal industry not only uses manpower, right from mining all the way up to distribution, but also creates business for small traders and distributors, who, in turn, create more employment opportunities. Thus, direct and indirect employment created by the coal industry is much larger than any other alternate resource

Interviewer: _____?

J. Milton: Coal is nonrenewable, which means that more coal cannot be produced once it is used. In addition, mining and burning coal harm the environment by disturbing ecosystems, increasing levels of sulfur dioxides and nitrogen oxides, and releasing mercury into the environment.

Interviewer: _____?

J. Milton: The major disadvantage of burning all fossil fuels is the release of carbon dioxide into the atmosphere. Increased carbon dioxide levels have been linked to climate change. Coal also releases the largest amount of carbon dioxide into the atmosphere compared to either oil or gas.

Interviewer: _____?

J. Milton: Another byproduct of burning coal as an energy source is the release of sulfur dioxide into the atmosphere. Sulfur dioxide converts to sulfuric acid through oxidation and becomes a component of acid rain.

Interviewer: _____?

J. Milton: The coal industry has reduced the amount of impurities released into the environment in the production of coal. Technologies such as scrubbers and catalytic converters have also reduced mercury emissions from coal use.

Interviewer: _____?

J. Milton: Coal is important resource in the power-generating sector. As of 2013, approximately 40 percent of the world's electricity was generated from coal and countries such as the United States and Germany relied on it to produce more than half of their electricity.According to the Secondary Energy Infobook, 92.9 percent of all the coal in the United States was used for electricity production in 2008.

Interviewer: These are really interesting facts. Thank you for this interesting conversation. We were happy to see you in our programme today.

UNIT 16

1 LEAD-IN

1 Are all sources of energy derived from nature?

2 What resources of energy are limited and will eventually run out?

3 What natural resources are not at risk of depletion from their use for energy production?

4 What energy sources impact the environment and generate pollution?

2 READING

2.1 Scan the text and choose the best headline for the text.

1 The World's Energy Demand

2 Why Energy Sources Are Depleted

3 Alternative Sources of Energy

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(1) Some estimates say our fossil fuel reserves will be depleted within 50 years,while others say they will last for 100 - 120 years. The fact is that neither one of these projections is very appealing for a global community that is so heavily dependent on fossil fuels to meet basic human needs. It is obvious that we are running out of fossil fuels for energy and we have no choice but to prepare for the new age of energy production since, most certainly, human demands for energy will not decrease.

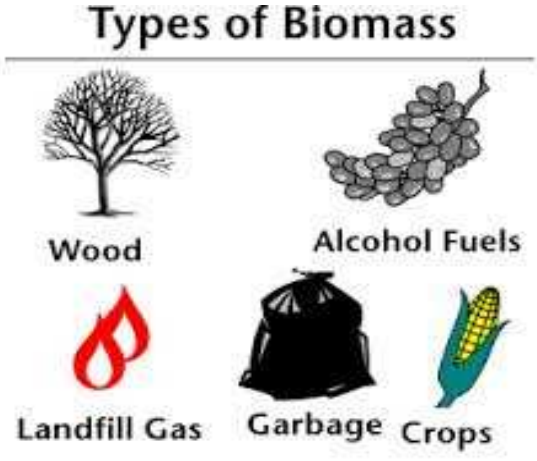
(2) Sun, wind and water are perfect energy sources depending on where you are. They are non-polluting, renewable and efficient. They are simple: all you need is sunlight, running water and/or wind. Not only does the use of renewable energy sources help reduce global carbon dioxide emissions, but they also add some much-needed flexibility to the energy resource mix by decreasing our dependence on limited reserves of fossil fuels.

(3) Essentially, these renewable energy sources create their own energy. The object is to capture and harness their mechanical power and convert it to

electricity in the most effective and productive manner possible. There's more than enough renewable energy sources to supply all of the world's energy needs forever; however, the challenge is to develop the capability to effectively and economically capture, store and use the energy when needed.

(4) Take solar energy for example. The ultimate source of energy is the sun. Its energy is found in all things, including fossil fuels. Plants depend on the sun to make food, animals eat the plants, and both ended up becoming the key ingredients for fossil fuels. Without the sun, nothing on this planet would exist. The sun also provides enough energy that can be stored for use long after the sun sets and even during extended cloudy periods. But making it available is much easier said than done. It would be cost prohibitive to make solar energy mainstream for major world's consumption in the near future. The technology is pretty much ready for many business and consumer applications, but it would be too expensive to replace the current energy infrastructure used for fossil fuel energy. Still, according to the European Photovoltaic Industry Association, solar power could provide energy for more than one billion people by 2020 and 26% percent of global energy needs by 2040.

(5) Wind and hydroelectric power, which have been used effectively for generations, are also rapidly growing energy markets. The principle behind both is that the forces of the wind and water currents are passed through turbines which convert their energy into electricity. Commercial wind energy is usually collected by wind 'farms' essentially consisting of hundreds of wind turbines (windmills) spread over large plots of land. But hydroelectric power is harnessed in several different methods. Another form of hydroelectric energy is tidal power. In use since the early 1900s, tidal power stations collect the energy created by the rise and fall of the tides to convert to electricity.



(6) Biomass energy, or energy from burning plants and other organic matter, is one of man's earliest sources of energy. Wood was once the main source of power for heat, and it still is in many developing countries. Most people in developed countries use wood only for aesthetic purposes or secondary heating, limited mainly to fireplaces and decorative woodstoves. Roughly one to two billion people in the

developing nations still use wood as their primary source of heat.It is this group that is seen being among the first to convert to solar heating and energy because there is no other existing infrastructure to hinder its development.

(7) Nobody really knows when the last drop of oil, lump of coal or cubic foot of natural gas will be collected from the Earth. All of it will depend on how well we manage our energy demands along with how well we can develop and use renewable energy sources.

(8) And here is one very important factor: population growth. As the population grows upwards towards nine billion people over the next 50 years, the world's energy demands will increase proportionately. Not only will it be important for renewable energy to keep up with the increasing population growth, but it must outpace not only these demands but begin replacing fossil fuel energy production if we are to meet future energy needs.

(9) By the year 2020, world energy consumption is projected to increase by 50%, or an additional 207 quadrillion BTUs✱. If the global consumption of renewable energy sources remains constant, the world's available fossil fuel reserves will be consumed in 104 years or early in the 22nd century. Clearly, renewable energy resources will play an increasingly vital role in the power generation mix over the next century.

✱*207 quadrillion BTUs = 2.18396561 × 1020 joules BTU (British thermal unit) – 1 британська термічна одиниця / год = 0.29307107 Ватта*

2.2 Read the text and decide which of paragraphs (1-9) in the text mentions

__ **a** energy sources which contribute to decreasing the consequences of global warming.

__ **b** that projections for the energy production are controversial.

__ **c** that the energy of this source is found in all things and it has the most powerful energy potential.

__ **d** the special abilities, skills and power of people to get control of renewable energy sources.

__ **e** the source of energy which has been used by people since the early history till modern times.

__ **f** using hundreds of special engines to get energy from this source.

__ **g** the increase of the world's energy demand in an appropriate amount over the coming decades.

__ **h** the time of and reason for the depletion of renewable energy sources.

__ **i** the necessity for succeeding in controlling both the people's need in energy resources and ability to use the latter in the best way.

2.3 Complete the following sentences according to the information in the text.

1 It is difficult to estimate precisely the fossil fuel reserves because ___ _____

2 The only conclusion we have to make about the energy production is that _____

3 The sun, wind and water are considered to be perfect energy sources, as _____

4 The main challenge of using renewable energy sources is_____ _____

5 The solar energy is very promising in the way to meet the global energy needs but_____

6 According to the European Photovoltaic Industry Association, solar power could provide energy for _____ _____

7 The principle of wind and hydroelectric power harnessing is that ___ _____

8 Biomass energy is the energy _____

9 The rate of oil, coal and gas depletion will depend on _____ _____

10 To predict the future of energy consumption and generation it is necessary to take into consideration _____

11 The role of renewable energy resources is vital because _____ _____

3 VOCABULARY

3.1

Match the verbs (1–9) with their definitions (a-i).

1	__	estimate	**a**	exhaust (a supply of something)
2	__	deplete	**b**	bring under control and direct the force of smth
3	__	run out	**c**	run or move faster than (someone or something else)
4	__	reduce	**d**	take the place of smth, supersede
5	__	harness	**e**	calculate roughly
6	__	capture	**f**	maintain a pace or rate set
7	__	keep up	**g**	gain control over
8	__	outpace	**h**	diminish , lower

9 __ replace **i** use up, empty entirely or partially

3.2 Choose the right words in italics to fit into the gaps Then read the text about renewable energy sources.

derived	***standpoint***	***technologies***	***toward***
extracted	***important***	***pollution***	***source***
efficient	***replenished***	***operate***	***environmentally-friendly***

What is Renewable Energy?

Renewable energy is energy (**1)**_____ from naturally-occurring sources that can be constantly (**2)** _____ such as solar, wind and hydroelectric power. This contrasts with energy sources like oil and coal, which rely on burning a material which must be found, (**3)** _____ and is not recreated. Renewable energy is often associated with (**4)**_____ , or green energy, since it largely involves the use of clean natural resources, though certain types of renewable energy do produce (**5)** _____ , and some even argue nuclear power is a renewable energy (**6)** _____ . As the global demand for energy increases, renewable energy has become an increasingly (**7)** _____ focus around the world, as relying on nonrenewable energy sources is an unsustainable practice in the long run.

Given the increasing population of the human race, the importance of renewable energy is likely to continue to increase in the future, as well as a shift (**8)**_____ more cost (**9)**_____ energy sources. Currently most of the world's vehicles (**10)**_____ on gasoline or diesel fuel derived from crude oil, and renewable substitutes to these fuels, such as ethanol, are not highly energy efficient. Other clean (**11)**_____, such as electric power, hydrogen power cells, compressed air, or new biofuels present possible sources of renewable and efficient fuels for vehicles. From the (**12)**_____ of electrical power, solar energy has a huge potential, considering the amount of energy the sun produces. It is thousands of times greater than the needs of earth.

4LANGUAGE REVIEW

4.1 Match the modal verbs in sentences (1–8) with their functions (a–h). Translate the sentences into your native language.

1 __ She ***may/might/could*** still be at work. **a** a situation is very unlikely or impossible

2	__	All three of their sons graduated at the top of their classes. They ***must be***proud of them.	**b**	50% or less certain about a present situation.
3	__	You should introduce yourself; he ***may/might not*** remember you.	**c**	a strong feeling of certainty, 90%
4	__	You got paid yesterday. You ***can't /couldn't*** have any money today.	**d**	impossibility in the past
5	__	He ***couldn't have taken***the money!	**e**	theoretical or habitual possibility
6	__	***Could/might*** it be that you don't want to leave?	**f**	50% or less certain that a situation is not possible
7	__	You ***can*** catch the train at 9:45. *or* She is very helpful, but she ***can*** be short-tempered.	**g**	possibility in the past
8	__	Ann ***may/might/could*** have forgotten to inform him.	**h**	the possibility of present situations (in questions)

4.2 Rephrase the following sentences in as many ways as possible to express possibility.

1 It's likely she has forgotten about the arrangement.
She _____

2 Perhaps he will come soon.
He _____

3 Mary is looking a bit tired. Perhaps she is working too hard.
Mary _____

4 That's definitely not the General Manager. He is far too young.
He _____

5 You seem very familiar. Perhaps we've met before.
We _____

6 It's likely we'll get in touch with them today.
We _____

7 Perhaps she is visiting our factory in France.
She _____

8 I'm certain that he didn't call us.
He _____

9 Yesterday I didn't put the papers in the safe. Luckily they were not stolen.
The papers _____

10 I don't know why he didn't tell me that he had left his job. It's possible he thought I would be angry.
He _____

4.3 Match the modal verbs and the substitute phrases in sentences (1–8) with their functions (a–h).Translate the sentences into your native language.

1 __	***Can*** I use this information? – Yes, of course.	**a**	giving permission (everyday speech)
2 __	***Could/may*** I talk to you? – Certainly.	**b**	asking permission (informal)
3 __	***May/Might*** I ask you another question? – Yes, of course.	**c**	asking permission (informal) (more polite)
4 __	You ***can*** ask to change the shifts.	**d**	giving permission (written notice /used in writing)
5 __	You ***may*** take only one item of hand luggage.	**e**	permission to do something in a particular situation in the past
6 __	I ***could/was allowed to*** go to parties when I was young.	**f**	asking permission (informal) when you don't know the other person very well
7 __	All the citizens over the age of 18 ***can/are allowed to*** vote.	**g**	permission (lows, regulations)
8 __	I ***was allowed to*** miss this meeting yesterday.	**h**	general permission to do something in the past

4.4 Underline the right option to express permission.

1 – Might I use your calculator?
– Of course you ***may/might***.

2 – Am I allowed to park in the car park of the company?
– Of course you ***may/are***.

3 – I ***could/was allowed to*** attend the seminar yesterday.
– Was it interesting?

4 – ***Can/Might*** I have this biscuit, Ann?
– Of course. Help yourself.

5 – Excuse me. ***May I/Am I allowed to*** leave the office for a while?
– Yes, but not for long.

6 – Could I arrive at work a bit later today?
– No, you ***couldn't/can't***.

7 – ***Can/Might*** I turn the TV off?
– Of course.

8 – ***Must/Might*** I look through the files on the former employees, sir?
– Yes. Use whatever you need.

4.5 Match the modal verbs and the substitute phrases with their functions in a sentence and translate the sentences into your native language.

1 __	***May*** I ***leave*** earlier today? ***Would*** you ***mind if I left*** earlier today? ***Would*** you ***mind my leaving*** earlier today?	**a** requesting permission (excessively formal)
2 __	***Might*** I ***leave*** earlier today?	**b** requesting permission (formal)
3 __	***Can*** I ***leave*** earlier today?	**c** requesting to do smth (formal)
4 __	***Would*** you please ***smoke*** outside? ***Could*** you ***smoke*** outside please? ***Would you be so kind as to*** smoke outside?	**d** requesting permission (informal)
5 __	***Will*** you ***smoke*** outside please? ***Can*** you ***smoke*** outside please?	**e** requesting suggestion/invitation (formal)
6 __	***Shall we go*** outside? ***Would you like to go*** to a table outside?	**f** requesting to do smth (informal)
7 __	***Why don't we go*** outside? ***Let's go*** outside?	**g** requesting suggestion/invitation (very informal)
8 __	***How about going*** outside?	**h** requesting suggestion/invitation (informal)

4.6 Determine the level of formality of the following requests.

1 Mail these letters.

a informal **b** formal **c** very informal

2 Would you please mail these letters for me?

a informal **b** formal **c** very formal

3 Could you mail these letters?

a informal **b** formal **c** depends on tone of voice

4 Can you mail these letters?

a informal **b** formal **c** depends on tone of voice

5 Do you think you could mail these letters?

a informal **b** formal **c** depends on tone of voice

6 Would you be so kind as to mail these letters?

a informal **b** formal **c** very formal

4.7 Complete the telephone conversation using the phrases from the list below.

Could you tell me	***can't see***	***could you speak***
Can I call you	***Could I speak to***	***I can't tell***
can you hear	***can I help you***	***Could you repeat***
can you send	***Could you hold***	

Operator: Good morning, the Murray Feiss Store, this is David speaking.

Customer: **(1)** _____ someone in Customer Services, please?

Operator: Yes,of course, I'll put you through.

Department Manager: Customer Services, Mark speaking, how (**2)** _____?

Customer: I'm calling about your Kovacs torchiere lamps (GK P256). **(3)** _____ if you have any in stock?

Department Manager: I'll just go and see. **(4)** _____ the line, please?

Customer: Yes, no problem, I'll wait.

Department Manager: Hello? I **(5)** _____ any on the shelves. I'll need to check the order status on the computer. **(6)** _____ back?

Customer: Certainly. My name is Mary Smith and my telephone number is 0786 1967.

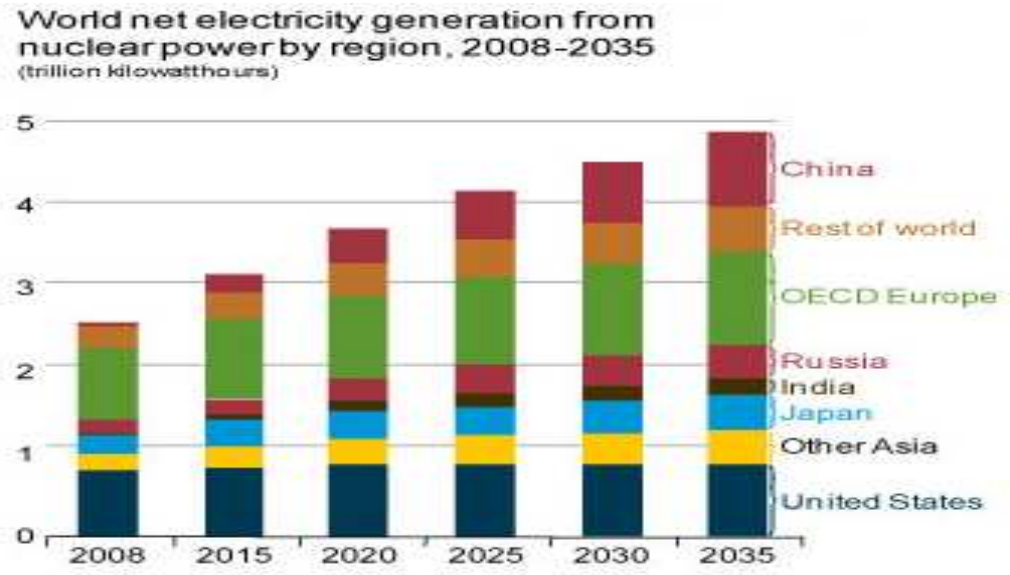
Department manager:	Sorry, **(7)** _____ up? It's a terrible line.
Customer:	Is that better? **(8)** _____ me now?
Department manager:	Yes, that's much better. **(9)** _____ the number please?
Customer:	Of course. It's 0786 1967. I'll be on this number all morning.
Department manager:	Sorry, **(10)** _____ you if we've got any Kovacs GK P256 in stock right now, but I'll get back to you as soon as I have the information. Was there anything else?
Customer:	Er, yes, **(11)** _____ me a copy of your latest catalogue?
Department manager:	Of course,I'll put one in the post to you today. What's your address?
Customer:	It's 15 Station Road, London.

5 SKILLS

PRESENTING FACTUAL INFORMATION

To address the uncertainty inherent in projections of nuclear power growth over the long term, a two-step approach is used to formulate the outlook for nuclear power. In the short term (through 2020), projections are based primarily on the current activities of the nuclear power industry and national governments. There is general agreement among analysts that nuclear projects are likely to become operational in the short term. After 2020, the projections are based on a combination of announced plans or goals at the country and regional levels and consideration of other issues facing the development of nuclear power, including economics, geopolitical issues, technology advances, environmental policies, supply chain issues, and uranium availability.Generally, it is supposed that nuclear generation worldwide will be increasing by 2.4 percent per year.

Using the bar chart presented below, compare the electricity generation from nuclear power in different regions in the world.



USEFUL PHRASES

Presenting Visuals

- As you can see from this bar chart...
- I'd like to show you ...
- Let me draw your attention to …
- Let's look more closely at …
- These figures refer to…
- This bar chart shows …
- As you can see, the main …
- The bar chart represents …
- Here you can see a comparison between ...
- On the bar chart you will note …
- We must focus our attention on ...

Commenting Trends

- a slight/ constant/ marked/ substantial/ increase in
- an increase of about/ roughly/ approximately…
- an overall increase in ...
- an upward trend in ...
- … reached record levels / reached a peak in
- a slight / notable / significant decrease in ...
- the downturn began in …
- an initial upward trend was followed by ...

UNIT 17

1 LEAD-IN

Test your general knowledge of the energy profile of Ukraine. Tick the correct answer.

1 What resources does the country's primary energy supply come from?

- **a** Uranium and coal.
- **b** Uranium and natural gas.
- **c** Coal and natural gas.

2 What type of energy is the country heavily dependent on?

- **a** Wind energy.
- **b** Thermal energy.
- **c** Nuclear energy.

3 What explains Ukraine's importance as a natural gas transit country?

- **a** Its geographic position.
- **b** Its proximity to Russia.
- **c** Its geographic position and proximity to Russia.

4 What do 'green tariffs' mean according to the Ukraine's version?

- **a** A temporary long-term measure to encourage production of energy from alternative energy sources, which is effective till 1 January 2030.
- **b** A tax that a government charges on energy that the industrial equipment consumes.
- **c** The prices for electricity generation that doesnot harm the health of people or environment.

2 READING

2.1 Look through the text quickly to find out what it is about. Choose the best summary of the text.

1 Major problem with fossil fuels in Ukraine.

2 Energy-related problems in Ukraine.

3 Nonrenewable and renewable energy sources in Ukraine.

UKRAINE'S ENERGY PROFILE

(1) The three types of energy generation facilities operate in Ukraine. These are thermal power plants (steam turbine and diesel types), hydroelectric plants and nuclear power plants. The role of wind and helium power plants is minor though it is increasing gradually.

At present, the situation in the electricity sector is as follows: the total capacity of all Ukraine's power plants is 52 GW, including 33.5 GW (64.4%) at thermal plants, 13.8 GW (26.5%) at nuclear plants and 4.7 GW (9.0%) at hydroelectric plants.

The priority energy resource in Ukraine is the natural gas. Its share in primary energy resources consumption makes up about 41 %. Ukraine belongs to countries with deficiency of domestic natural hydro carbonic resources namely the domestically produced gas meets only 20 – 25% of total gas demand, while the Ukraine's oil production meets only 10 – 12% of the oil requirement. The oil and gas share in the general balance of the use of primary energy resources in Ukraine makes up 59.4 %.

In 1991 the consumption of gas made up 118.1 billion cubic meters and the country was the third in the world after the USA and Russia. For the last 15 years the consumption of natural gas in Ukraine has decreased. In 2007 it made up 73.4 billion cubic meters. The consumption of oil and petroleum product has decreased from 29 to 25 million tons for the last years. The extraction of natural gas in the country had been declining over a long period. Since 1997 till 2000 it stabilized at the level of 18 billion cubic meters per year, and in 2007 it made up 20.7 billion cubic meters. The extraction growth increased due to drilling new oil wells, effective utilization of operating fund of wells, and introducing the methods of secondary and tertiary oil and condensate recovery.

(2) Coal is the only energy carrier, which reserves are sufficient **(a)** _____ for the national economy for over 300 years. Ukraine is the eighth country in the world in terms of coal reserves. The share of coal in all organic fuel reserves in the country amounts to 95%. The total estimated coal reserves are 117.3 billion tons. Most

of the coal resources are found in the Donetsk and Dnieper **(b)** _____ . The **(c)** _____ amount to 177 billion tons. Most of the country's hard coal resources are in the Donetsk basin. Brown coal reserves are in the Dnieper basin that is currently of relatively minor importance. Ukraine's **(d)** _____ are the oldest in the CIS as 30% of the mines have been in operation for more than 50 years. Actually the outdated equipment and inefficient technologies are used there. The main efforts must be put into the introduction of new **(e)** _____ and highly technological mining equipment, the improvement of the coal sector safety, the development of the state concept aimed at the **(f)** _____ in the industry.

(3) The operation of the Ukraine's system for oil transit is provided by OJSC (*Open Joint Stock Company*) Ukrtransnafta. It consists of 19 oil-trunk pipelines with the total length of 4,766.1 km. The annual capacity of the system for oil transit from the Russian Federation is 114 million tons at the point of entry, and 56.3 million tons at the exit point. If necessary, the oil pipeline system is capable of fully meeting the requirements of the refineries given their maximum design refining capacity is more than 50 million tons per year. The oil pipeline system operation is ensured by 51 oil pumping stations with 176 pumping units having an aggregate capacity of 356,500 kW. The tank battery has an aggregate capacity of 1,085,000 cubic meters.

The oil pipelines have been in operation for 20 – 44 years and 90% of

them have exceeded their depreciation period. Good condition of the oil transportation facilities is being maintained, but they are obsolete, and they must be replaced or upgraded, and require additional operational costs. It is necessary for the good condition of the existing oil pipeline system to be compatible with the international standards. It requires implementing new processes and technologies including energy-efficient electric motors and variable-frequency electric drives, highly efficient pumps, state-of-the-art tank battery equipment, the advanced automatic and remote control systems, turbulence-resistant additives, effective pipeline anticorrosive coating and pipeline electrochemical protection systems. The efficient processes for removing the bottom water and paraffin sediments from pipelines and tanks, the equipment to control the oil volume and quality,

the advanced systems for the oil pipelines diagnostics and maintenance, the information analysis systems for optimizing the modes of the oil transportation system operation must be also implemented.

(4)___ ***a)*** TheUkraine's energy profile represents a high level of dependency on imported fossil fuels with about 80 – 90 % of oil and 75 – 80 % of gas primarily imported from Russia. The recent events in Ukraine facing the gas price surge make Ukraine more aware of using renewable energy and implementing energy conservation measures as a national strategy as Ukraine having the population of about 47 million appears to be the sixth largest gas consuming country in the world. At the same time Ukraine is rated as the sixth biggest carbon dioxide emitting country in the world. Another fact that increases the Ukraine's interest in renewable energy is the Chernobyl Nuclear Power Plant disaster that still echoes in high-public awareness regarding the use of atomic power plants in Ukraine.

___ ***b)*** The use of renewable energy sources in Ukraine accounts for about 8 % of its electricity generation but less than 3 % of the total energy consumption with the main part of about 75 % being contributed by large hydro-power plants. Meanwhile Ukraine has a huge potential of renewable energy resources of almost all the types (solar, wind, biomass, biofuel, geothermal and micro hydropower). Tapping into these resources promises a great potential in accordance with the world's trend for using renewable energy and with the Kyoto protocol, which was signed by Ukraine together with the other countries.

___***c)*** In 1996 the government of Ukraine declared the programme targeted at raising up to 10% the consumption of energy produced from renewable energy resources. Then in 2001 the President of Ukraine signed the decree that provided the tax rebate for the companies developing solar, wind and geothermal projects. The current national programme envisions achieving the use of renewable energy sources at the rate that is comparable with the targets set by some of European countries. The total capacity of alternative energy facilities in Ukraine is 411 megawatts (107 operating facilities including 76 hydroelectric power plants, 18 solar power plants, 11 wind farms and two bio-energy facilities) or 0.8% of the power generating capacity of the country.

In 2011, 257 megawatts of alternative energy facilities were commissioned. In 2012, a number of wind farms with the total capacity of 252 megawatts and solar power plants with the total capacity of 290 megawatts were launched.

2.2 Read Part 1 of the text in 2. carefully. Choose the correct option *a, b, c* or *d*.

1 According to the first paragraph,

a the three types of energy generation facilities operate successfully in Ukraine.
b the role of each of the three energy generation facilities is equal.
c electricity in Ukraine is produced at engineering plants.
d the process of energy production in Ukraine is represented in numbers.

2 The production and consumption of natural gas and oil in Ukraine

a is characterized as deficient.
b is sufficient and equals 25% of its total demand.
c meets more than 40% of the priority energy resources requirement.
d is estimated in relation to the general balance of the use of primary energy resources.

3 The last two decades in the production and consumption of gas and oil in Ukraine

a showed a stable progress.
b are characterized as declining.
c were at first not satisfactory for the industry and then were stabilized.
d are marked as the effective utilization of power plants and the introduction of new technologies.

2.3 Read Part 2 of the textcarefully, and decide which phrases 1-6 fit logically in the gaps (a –f).

___ **1** coal basins
___ **2** coal mines
___ **3** attraction of investments
___ **4** domestic coal reserves
___ **5** to meet the needs
___ **6** energy efficient technologies

2.4 Read Part 3 of the text carefully, and decide which of sentences 1-5 are true (T) or false (F).

		True	False
1	Ukrainian oil transportation system consists of 19 oil-trunk pipelines.	___	___
2	OJSC Ukrtransnafta transits oil from the Russian Federation.	___	___
3	The oil pipeline system can transit 50 million tons of oil per year.	___	___
4	The oil pipelines have been in operation for more than 40 years and still don't require replacement or upgrading and are not obsolete.	___	___
5	The condition of the existing oil pipeline system can't be improved with the introduction of new processes and technologies.	___	___

2.5 Read Part 4 of the textand decide which of the sentences A, B, C or D sums up best what the paragraphs (a–c) are about. There is one extra sentence which you do not need to use.

___ **A** New strategy inthe Ukraine's energy production and consumption policy.

___ **B** The role ofrenewable and nonrenewable energy sources in the Ukraine's energy production and consumption policy.

___ **C** Factors influencing the Ukraine's energy production and consumption policy.

___ **D** Great potential of renewable energy sources in Ukraine.

2.6 Answer the following questions to the text.

1 What is the total capacity of all Ukraine's power plants and what are the shares of thermal plants, nuclear plants and hydroelectric plants in it?

2 How has the consumption of natural gas and oil changed in Ukraine over the recent years?

3 Where must the main efforts in Ukraine's coal industry go into?

4 How important is the development of renewable energy sources in the country?

3 VOCABULARY

3.1 Match the following words from the textto make up word partnerships.

1	__	power generation	**a**	capacity
2	__	steam	**b**	fund
3	__	total	**c**	economy
4	__	energy	**d**	turbine
5	__	resources	**e**	basin
6	__	remote	**f**	costs
7	__	operating	**g**	facilities
8	__	coal	**h**	carrier
9	__	national	**i**	consumption
10	__	operational	**j**	control
11	__	depreciation	**k**	period

3.2 Use the partnerships from 3.1 to complete the following sentences.

1 _____ _____is a part of the earth's surface consisting of coal strata that slope down to a common centre.

2 A _____ _____ is a device that extracts thermal energy from pressurized steam and uses it to do mechanical work on a rotating output shaft.

3 The South Ukraine Nuclear Power Station has three VVER-1000 reactors and a _____ _____ of 2,850 megawatts (MW).

4 The continued trend toward greater _____ _____ and wider environmental impacts is apparent in developed and developing countries.

5 The _____ _____ includes the sectors of the production sphere, where material social product is created, and sectors of the nonproduction sphere, where non-material services are performed.

6 A _____ _____ is a component of an electronics device originally used for operating the device wirelessly from a short line-of-sight distance.

3.3 Choose the right words from below to fit into the text about the Chernobyl disaster in Ukraine.

accident	***occurred***	***challenge***	***radiation***	***estimated***
error	***reactors***	***produced***	***causing***	***government***
worst	***facility***	***mortality***	***releasing***	

The Chernobyl disaster was a nuclear **(1)** _____ that occurred on 26 April 1986 at the Chernobyl Nuclear Power Plant in Ukraine. It is considered the **(2)** _____ nuclear power plant accident in history, and is one of only two classified as a level 7 event on the International Nuclear Event Scale (the other being the Fukushima Daiichi nuclear disaster).

The Chernobyl Nuclear Power Station included four nuclear **(3)** _____ , each capable of producing one gigawatt of electric power. At the time of the accident, the four reactors **(4)** _____ about 10 percent of the electricity used in Ukraine.

The construction of the Chernobyl power station began in the 1970s. The first of the four reactors was commissioned in 1977, and Reactor No. 4 began producing power in 1983. When the accident **(5)** _____ in 1986, two other nuclear reactors were under construction.

On April 26, 1986, the operating crew planned to test whether the Reactor No. 4 turbines could produce enough energy to keep the coolant pumps running until the emergency diesel generator was activated in case of an external power loss. During the test, power surged unexpectedly, **(6)** _____ an explosion and driving temperatures in the reactor to more than 2,000 degrees Celsius — melting the fuel rods, igniting the reactor's graphite covering, and **(7)** _____ a cloud of **(8)** _____ into the atmosphere.

The precise causes of the accident are still uncertain, but it is generally believed that the series of incidents that led to the explosion, fire and nuclear meltdown at Chernobyl was caused by a combination of reactor design flaws and operator **(9)** _____ .

After the accident, Reactor No. 4 was sealed, but the Ukrainian **(10)** _____ allowed the other three reactors to keep operating because the country needed the power they provided. Reactor No. 2 was shut down after a fire damaged it in 1991, and Reactor No. 1 was decommissioned in 1996. In November 2000, the Ukrainian president shut down Reactor No. 3 in an official ceremony that finally closed the Chernobyl **(11)** _____ .

Estimates of the eventual death toll from Chernobyl vary widely. A 2005 report by the Chernobyl Forum — eight U.N. organizations — **(12)** _____ the accident eventually would cause about 4,000 deaths. Greenpeace places the figure at 93,000 deaths, based on information from the Belarus National Academy of Sciences. The Belarus National Academy of Sciences estimates 270,000 people in the region around the accident site will develop cancer as a

result of Chernobyl radiation and that 93,000 of those cases are likely to be fatal. Another report by the Centre for Independent Environmental Assessment of the Russian Academy of Sciences found a dramatic increase in **(13)**_____ since 1990 — 60,000 deaths in Russia and an estimated 140,000 deaths in Ukraine and Belarus —probably due to Chernobyl radiation. The biggest **(14)** _____ facing communities still coping with the fallout of Chernobyl is the psychological damage to five million people in Belarus, Ukraine and Russia.

4 LANGUAGE REVIEW

4.1 Match the modal verbs in sentences (1–14) with their functions.Translate the sentences into your native language.

1	__	I ***could lend*** you my car till tomorrow.	**a**	making offers only in first-person questions
2	__	***Might*** I help you?	**b**	making polite offers
3	__	***May*** I carry your suitcase, Madam? ***Shall*** I copy this document for you?	**c**	making hesitant offers
4	__	***May/Could*** we visit grandma at the weekend? ***May/could*** I help you?	**d**	making a suggestion requesting permission or agreement
5	__	***Shall*** I turn off the light?	**e**	polite suggestion
6	__	You/we ***could***participate in that contest.	**f**	strong suggestions like advice
7	__	You ***should*** go home early tonight.	**g**	making a suggestion as being an option
8	__	I thought you ***might want/like*** to read this.	**h**	formal/infrequent suggestion
9	__	***Shall*** we have lunch together?	**i**	polite suggestion
10	__	You ***ought to/should*** drive carefully in bad weather. You look tired. You ***shouldn't*** stay up late, you ***should*** have a rest.	**j**	strong advice
11	__	You ***must*** revise for your test.	**k**	advice
12	__	You ***should/ ought to*** be more careful. She ***could/should/ought to*** be more polite.	**l**	criticism or disapproval with reference to past time

13	__	You ***shouldn't be*** sitting here just doing nothing! You ***might be*** more attentive. George ***could*** really help you! You ***can be*** really annoying, you know!	**m**	criticism
14	__	Sam failed his exam. He ***should have*** worked harder. (*but he didn't*) He ***should haven't*** skipped lessons. (*but he did*) You ***might have*** told me you weren't coming! John ***could*** really ***have*** helped you!	**n**	criticism or disapproval with reference to present or future time

4.2 Use *shall* or *will* in the following sentences.

1 _____you give me a hand with these suitcases?
2 _____I send the agenda of the meeting?
3 What _____ we select for the next exhibition?
4 _____you answer the phone, please?
5 Where _____ we sit in the conference room?
6 _____ we have a short break now?
7 _____ I do that or _____ you?
8 _____ I switch on the light?

4.3 Use *should/oughtto* or *should/ought to have* with the verbs in brackets.

1 Sarah _____ (***not/be***) late so often. That's what caused her problems at work.
2 You _____ (***phone***) them and cancel the order. The prices are very high and we won't be able to pay for these electrical appliances.
3 He _____ (***not/refuse***) if he was offered such an interesting job.
4 You _____ (***get***) a laptop. They are so convenient if you often travel on business.
5 You _____ (***buy***) a travel guide if you didn't know the city well.
6 They lost a lot of money on their investment. They _____ (***be***) more careful.
7 You _____ (***not/worry***) so much. We'll be able to finish the work in

time.

8 They _____ (***mention***) that earlier. We could have taken some measures.

4.4 Choose and underline the right option.

1 **A:*Could/May/Shall*** you tell me the time, please?
B: It's half past ten.

2 **A: *May/Should/Would***I help you?
B: Yes, please. ***Can/Shall/Would*** I have some information about this new model?

3 **A:*Would/ Should/ Shall***I send you our new brochure?
B: No, thank you. We have already have it.

4 **A: *Can/Shall/May***you give me the details of this project, please?
B: Certainly. I'll send you all the files in a couple of minutes.

5 **A: *Shall/May /Could***you help me with my report?
B: Yes, of course.

6 **A: *Couldn't/May/Can***I speak to Tim Wail, please?
B: Just a moment, please. I am putting you through.

7 **A: *Could/Would/Will***Iuse your telephone, please?
B: Yes, of course.

8 A: ***Should/ May/ Will*** I sit down, please?
B: Yes, of course. Make yourself at home.

4.5 Match the items in column A to their synonyms in column B.

	A		**B**	
1	—	You should/ought to …	**a**	You aren't allowed to …
2	—	You must …	**b**	It wasn't necessary for us to... (but we did)
3	—	Shall we …?	**c**	Why don't we …?
4	—	You needn't …	**d**	He managed to …
5	—	We needn't have …	**e**	It wasn't necessary for us to …
6	—	We didn't need to …	**f**	You had better …
7	—	You mustn't …	**g**	I'm sure she's …
8	—	He was able to …	**h**	Do you mind if I …?
9	—	She must be …	**i**	You are obliged to …
10	—	He can't be …	**j**	It isn't necessary for you to …

11	—	Could I …?	**k**	I’m sure he isn’t …
12	—	He may be …	**l**	Perhaps he’s …

4.6 Rewrite each of the sentences. Start with the words given and use one of the modal verbs.

1 Our company will possibly buy new equipment to meet the customers’ demands.
Our company _____

2 It is not necessary for you to stop the assembly line to domaintenance work.
You _____

3 It is very important to follow the instructions closely.
You _____

4 The workforce is allowed to have a short break twice a day.
They _____

5 I’m sure the General Manager is not in the office, he went to the factory a couple of hours ago.
The General Manager _____

6 They managed to increase the productivity.
They _____

7 You are forbidden to enter this area.
You _____

8 You ought to have signed all these papers before you left the office. (BUT you didn’t)
You _____

9 They are obliged to wear a uniform at work.
They _____

10 Why did you change the terms of delivery? It wasn’t necessary.
You _____

11 I advise you to spend more time on the study of the international experience in this field.
You _____

5 SKILLS

GIVING A FORMAL PRESENTATION

In your business career you will have to give some formal presentations at

conferences or other events.

Prepare a presentation of the renewable energy sources potential in Ukraine. Use the information given in the text in 2.5. Surf the Internet to find out more about the subject under consideration. Look through some recommendations to the structure of apresentation and useful language highlighted below.

- At the beginning, you should introduce yourself and state the purpose of your presentation.
  - Right then, let's get started. For those of you who don't know me, I'm ……., the representative of …… . Today, I'm going to be showing you …… (***informal***)
  - Good morning, ladies and gentlemen. Let me first introduce myself, my name is …… and my role in …… is …… . This morning my objective is to ……(***more formal***)
- Once you have greeted the audience and introduced yourself, you must then explain the content of your presentation. You can do this in a variety of ways, but the most common method is to outline briefly the structure. To do this you should use some connectors or signaling language. Unlike writing, a presentation has no paragraphing to help an audience know when the speaker is changing subject or concluding his remarks. So this signaling language is crucial in the main part of the presentation too, and will help the audience understand and appreciate your presentation.

INTRODUCTION

State what you will do	**State how you will do it**
What I'd like to do is to discuss …	I'm going to deal with three aspects of the subject …
What I intend to do is to explain …	I'm going to divide my presentation into … sections.
In my talk today, …	I've divided my presentation into … sections.
My topic today is …	I thought it would be useful to divide my talk into … sections.
Today, I'm going to talk about …	This subject can be looked at under the following headings: …
I'm going to talk to you about …	I'll take about ... minutes.
My colleagues and I are going to give a short presentation on …	
Today I want to consider …	
In this talk, I would like to concentrate on …	

The subject of this talk is …
The purpose of this talk is to …
This talk is designed to …

The talk should last about ... minutes.
I'll be happy to answer questions at the end.
If you have any questions, I'll try to answer them afterwards.
If you have any questions, please feel free to interrupt.

MAIN BODY

Ordering points

Firstly, …
To start with, …
First of all, …
Secondly, …
Next, …
Then, …
Thirdly, …
Lastly, …
Finally, …

Giving examples

For example, …
For instance, …
And as proof of that, …
Remember …
You only have to think of …

Emphasising

Furthermore …
What's more, …
This supports my argument that …
It follows, therefore, that …

Referring back to what you have said

As I said at the beginning, ...
In the first part of my talk, I said …
As I mentioned earlier, …
I told you a few minutes ago that …

Putting it in other words

In other words, …
That is to say, …
To put it another way, …
The point I'm making is …
What I'm suggesting is …
Let me put it another way…

Using visuals

On this graph, …
Take a look at this.
Let's have a look at this.
I'd like you to look at this.
I'd like to draw your attention to …
Here we can see …
The … represents …
The graph illustrates …
As you can see, …
If you look closely,

you'll see …

MOVING ON

I'd like now to move on to …
Turning now to …
Moving on now to …
Having looked at …, I'd now like to consider …
Now, let's turn to ...
I now want to turn to …
The next point is …
Another interesting point is …
The next aspect I'd like to consider is …
I'd now like to turn to …

CONCLUSION

Concluding

So …
We've seen that …
First we looked at … and we saw that . ..
Then we considered … and I argued …
In short …
In brief, we have looked at ...
To sum up …
In conclusion, I'd like to emphasise that …
I think that covers most of the point.
That completes my presentation.
Thank you for your attention.

Invite questions

That covers the main points. If you have any comments or questions, I'll be happy to hear them.
So that explains my main point.
Does anyone have any comments or questions?
I'd be glad to answer any questions.

GRAMMAR REFERENCES

Unit 1

Parts ofSpeech

a noun	a word that identifies a person, a thing, an idea, quality, or state	*engineer, building, danger*
a verb	a word that describes what a person or thing does or what happens	*run, travel, develop*
an adjective	a word that describes a noun, giving extra information about it	*technical, Ukrainian, important*
an adverb	a word used to give information about a verb, adjective, or other adverb; when used with a verb, adverbs can give information about how, where or when something happens	*easily, here, soon*
a pronoun	a word used in place of a noun that has already been mentioned or that is already known, often to avoid repeating the noun	*she, he, I, they*
a preposition	a word usually used in front of nouns or pronouns and showing the relationship between the noun or pronoun and other words in a sentence	*in, with, under*
a conjunction	a word that is used to connect phrases, clauses, and sentences	*but, because, and*
an interjection	a word added to a sentence to convey emotion	*oh, hey, eh*

Sentence Structure

A simple sentence has one clause, beginning with a noun group called the subject. The subject is the person or thing that the sentence is about. This is followed by a verb group, which tells you what the subject is doing, or describes the subject's situation.

The verb group may be followed by another noun group, which is called the object. The object is the person or thing affected by the action or situation. *The electric power industry provides **the production and delivery of electric energy**.*

After link verbs like ‘be’, ‘become’, ‘feel’, and ‘seem’, the verb group may be followed by a noun group or an adjective, called a complement. The complement tells you more about the subject.*He was **an electrician**.*

The verb group, the object, or the complement can be followed by an adverb or a prepositional phrase, called an adverbial. The adverbial tells you more about the

action or situation, for example how, when, or where it happens.There can be two kinds of objects within a sentence: direct and indirect objects.A direct object is a noun or pronoun that receives the action of a verb. *He fixes electrical appliances.*

An indirect object is the noun or pronoun for which the action is done. *He fixes electrical appliances for all departments.*

The word order of a clause is different when the clause is a statement, a question, or a command.

The basic word order of a sentence that is not a question or a command is usually as follows:

subject	**verb**	**object**			**adverbials**		
		indirect	**direct**	**prepositional**	**How?**	**Where?**	**When?**
The company	*delivered*		*new installations*				*yesterday.*
We	*inform*	*them*			*very seldom.*		
She	*has sent*		*all the files*	*to the manager.*			
The client	is waiting					*in the office.*	

The time reference can be put in the beginning. ***Yesterday*** *we signed the contract with a new supplier.*

Word Building

- **Prefixes** are syllables which we add before certain words to form new words. The meaning of the new words depend on the prefix that has been used.

anti- = ***against***(anticlockwise)
bi- = ***two*** (bilingual)
co- = ***with***(co-educational)
counter- = ***in the opposite direction*** (counterattack)
ex- = ***previous, former*** (ex-president)
inter- = ***between*** (interstate)
mis- = ***done wrongly or badly*** (misread)
mono- = ***one*** (monolithic)
multi- = ***many*** (multicultural)
non- = ***not*** (nonexistent)
out- = ***more, better*** (outlast)
over- = ***(done) to a great extent*** (overdo)
post- = ***after*** (postwar)
pre- = ***before*** (prenuptial)
pro- = ***in favour of*** (pro-American)

re- = ***again*** (redesign)
semi- = ***half*** (semi-circle)
sub- = ***under, less*** (subordinate)
super- = ***big, more*** (superior)
trans- = ***from one side, group etc to another*** (transatlantic)
tri- = ***three*** (triathlon)
under- = ***not enough*** (underdeveloped)
uni- = ***one*** (uniform)

The prefixes below are used to express opposite meanings.

de- destabilize, dethrone
dis- disadvantage, disbelief
in- insufficient **BUT**
il- (***before* l**) illegal
im- (*before* b, m, p) immature, improbable
ir- (***before* r**) irregular **BUT** unreal, unremarkable
non- non-dairy
un- unattractive, uncivilized

Some prefixes are added to words to form verbs.

en- courage – encourage
BUTem-*before*b, m, p) body – embody

- **Suffixes** are syllables which we add to the end of certain words to form new words.
  - **Nouns referring to people**
    - **verb + *-er/-or/-ar (***work – worker,act – actor, burgle – burglar)
    - **noun/verb/adjective + *-ist***(social – socialist, piano – pianist, natural – naturalist)
    - **verb + *-ant/-ent* (**assist – assistant, reside – resident)
    - **noun + *-an/-ian***(republic – republican, Italy – Italian)
    - **verb + *-ee (passive meaning)*** (employ – employee)

  - **Nouns formed from verbs**

-age post – postage
-al propose – proposal
-ance perform – performance
-ation animate – animation
-ence coincide – coincidence
-ion televise – television
-ment employ – employment
pretend – pretension ***(verbs ending in –d/-t)***
-sis hypothesise – hypothesis

-tion describe – description
-ure close – closure
-y discover – discovery

– **Nouns formed from adjectives**
-ance relevant – relevance
-cy urgent – urgency
-ence patient – patience
-ion isolated – isolation
-iness happy – happiness
-ness sad –sadness
-ity relative – relativity
-ty royal – royalty
-y honest – honesty

– **Adjectives formed from nouns**
-ous nausea –nauseous
-al nation – national
-ic history – hystoric
-ical theatre – theatrical
-ish girl – girlish
-ive suppression – suppressive
-ful (with) dread – dreadful
-less (without) name – nameless
-ant brilliance – brilliant
-able reason – reasonable
-y wealth – wealthy
-ly world – worldy

– **Adjectives formed from verbs**
-able treat – treatable (verbs ending in **–d/-t**)
-ible sense – sensible
-ive exclude – exclusive
-ate consider- considerate
-ent differ – different

– **Verbs formed from adjectives**
-en bright – brighten
-ise real- realize

– **Verbs formed from nouns**
-en strenth - strenthen

Present Simple

We use the present simple for

- facts and permanent states. *You **need** a wide range of skills in order to run a successful business.*
- general truths and laws of nature. *People **depend** on earth's resources.*
- habits and routines (with always, usually, etc). *I usually **loose** my patience with time-wasters.*
- timetables and programmes (in the future). *The next competition **starts** at 3:00 tomorrow.*
- sporting commentaries, reviews and narrations. *Simon **takes** the ball, **passes** it to Henry and **score**s.*
- feelings and emotions. *I **have** a dislike of rock music. I think it **sounds** excessively loudly.*

The **Present Simple** is used with the following **time expressions**: ***usually***, ***often***, ***always***, ***every day/week/month/year*** etc., ***in the morning/afternoon /evening***, ***at night/the weekend***, on Fridays, etc.

Adverbs of Frequency

Adverbs of frequency (*always*, *usually*, *often*, *sometimes*, *seldom/rarely*, *never*, etc.) come before the main verb (*choose*, *design*, etc.) but after the verb *to be*, auxiliary verbs (*do*, *have*, etc.) or modal verbs (*can*, *should*, etc.). Adverbs of frequency go before the auxiliary verbs in short answers.*We always send reports to the head office. He is rarely in the office. You must always be on time*.

Expressions such as *every day*, *once/twice a week/month/year*, *most mornings/ evenings*, go at the beginning or the end of a sentence.

Usually, *often*, *sometimes*, *normally* and *occasionally* can go at the beginning or the end of a sentence for more emphasis. *Usually, I read my emails when I arrive at work.*

The adverbs *never*, *seldom* and *rarely*have a negative meaning and are never used with the word *not.I never go on business abroad*.

Personal Pronouns. Possessives.

Subject pronouns go before verbs as subjects and object pronouns go after verbs or prepositions as objects. ***They*** (subject pronoun) *want* ***him***(object pronoun) *to be there*. A noun and a personal pronoun are not used together.

Possessive adjectives and possessive pronouns can be used to talk about ownership or the relationship between people. Possessive adjectives are followed by nouns, whereas possessive pronouns are not. *This is* ***her***(possessive adjective) *responsibility*. *This responsibility is* ***hers*** (possessive pronoun).

Personal Pronouns		**Possessive Adjectives and Pronouns**	
subject form	**object form**	**possessive adjective**	**possessive pronoun**
I	me	my	mine
you	you	your	yours
he	him	his	his
she	her	her	hers
it	it	its	its
we	us	our	ours
you	you	your	yours
they	them	their	theirs

Unit 2

Countable and Uncountable Nouns

Nouns can be **countable** (those that can be counted) *one engineer*, *two engineers* etc. or **uncountable** (those that can't be counted) *electricity*, *energy*.

The most common uncountable nouns are: **mass nouns**: (**fluids:***oil*, *water*, etc.; **solids:***coal*, *iron*, etc.; **gases:***air*, *oxygen*, etc.; **particles:***dust*, *sand*, etc.); **subjects of study**: *chemistry*, *physics*, etc.; **languages:***English*, *French*, etc.; **games:***chess*, *golf*, etc.; **diseases:***flu*, *measles*, etc.; **natural phenomena**: *gravity*, *lightning*, etc.; **some abstract nouns:**, *evidence*, *information*, etc.; **collective nouns:***baggage*, *rubbish*, etc.

Many uncountable nouns can be made countable by adding a partitive: *a piece of paper/information/advice; a bottle of water*; *a jar of jam; a sheet of paper; a packet of tea; a slice/loaf of bread; a pot of yoghurt; a pot/cup of tea; a kilo/pound of meat; a tube of toothpaste; a bar of chocolate/soap; a bit/piece of chalk; an ice cube; a lump of sugar; a bag of flour; a pair of trousers; a game of soccer; a(n) item /piece of news; a drop/can of oil; a can of Cola; a carton of milk; a block of wood; a flash/bolt of lightning; a clap/peal of thunder* etc.

Countable Nouns

- can take singular or plural verbs

*When two materials **are** in contact, electrons may move from one material to the other.*

- always go with *a/an/the/my*, etc. in the singular

*They paid **their** electricity bill.*

- can be used alone or with *some / any / many / few* in the plural

*The descriptions of **many** experiments and discoveries of early electrical scientists may be found in the scientific publications.*

Uncountable Nouns

- always take singular verbs

Lightning is a dramatic natural example of static discharge.

- do not go with *a/an/one/two*, etc.

Silver is more conductive than copper.

- can be used alone or with *some/any/much/little/ the/my*, etc.

***Some** information is already available.*

Some nouns take only a plural verb. These are objects which consist of two parts: **garments** (*pyjamas* etc.), **tools** (*scissors* etc.), **instruments** (*binoculars*, etc.) or **nouns such as**: *arms, ashes, barracks, clothes, congratulations, earnings, (good) looks, outskirts, people, police, premises, riches, stairs, surroundings, wages* etc.

Group nouns refer to a group of people. These nouns can take either a singular or a plural verb depending on whether we see the group as a whole or as individuals. (*army, audience, class, club, committee, company, council, crew, crowd, headquarters, family, jury, government, press, public, staff, team etc.)This construction team is the best in the city*. (= the team as a group) *The team were all given special tasks*. (= each member separately as individuals)

With expressions of duration, distance or money meaning ‘a whole amount’ we use a singular verb. *Two hundred thousand pounds is too much to spend on this project.*

The Plural of Nouns

Nouns are made plural	
by adding **-*s*** to the noun	*installation–installation**s***
by adding **-*es*** to nouns ending in **-s, -ss, -x, -ch, -sh, -z**	*torch – torch**es***
by adding **-*ies*** to nouns ending in **consonant + y** but **-s** to nouns ending in **vowel + y**	*lady – lad**ies*** *day – day**s***
by adding **-*es*** to nouns ending in **consonant + o**	*potato – potato**es***

by adding **-*s*** to nouns ending in **vowel + o**, double **o**, abbreviations, musical instruments, proper nouns	*studio – studio**s**, zoo – zoo**s**, memo – memo**s**, CEO – CEO**s**,piano – piano**s**, Eskimo – Eskimo**s***
by adding **-*s*** or **-*es***to some nouns ending in **-o**	*zero – zero**es**/zero**s***
by adding **-*ves*** to some nouns ending in **-f/-fe**	*half – hal**ves*** BUT: *belief – belief**s**, chief – chief**s**, cliff – cliff**s**, handkerchief– handkerchief**s**, hoof – hoof**s**/ hoo**ves**, roof – roof**s**, safe – safe**s***
some nouns of Greek or Latin origin form their plural by adding Greek or Latin suffixes,	*bas**is** – bas**es**, cris**is** – cris**es**, termin**us** - termin**i**, criteri**on**– criteri**a**, phenomen**on** – phenomen**a**, stimul**us** – stimul**i**, dat**um** – dat**a**, medi**um** – medi**a***
compound nouns form their plural by adding -**s/es**: • to the second noun if the compound consists of two nouns • to the noun if the compound consists of an adjective and a noun • to the first noun if the compound consists of two nouns connected by a preposition or to the noun if the compound has only one noun • at the end of the compound if it does not include any nouns	*energy system – energy system**s*** *frying pan – frying pan**s*** *mother-in-law – mothers-in-law* *passer-by – passers-by* *letdown – letdowns*
irregular nouns	*man – **men**, woman – **women**, foot – **feet**, tooth – **teeth**, louse– **lice**, mouse – **mice**, child – **children**, goose – **geese**, sheep – **sheep**, deer – **deer**, fish – fish, trout –**trout**, ox– **oxen**, salmon – **salmon**, spacecraft – **spacecraft**, aircraft – **aircraft**, means – **means**, species – **species**, hovercraft – **hovercraft***

There is / There are

'***There***' can be used as the impersonal subject to talk about:

- the existence or presence of someone or something *There are many sources of information*.
- something that happens *There's a meeting of the heads of departments every week.*
- a number or amount *There were five candidates for the position advertised*.

'***There***' is used with a singular verb when the noun group after the verb is singular or uncountable. *There is not enough room for the equipment bought.*

'***There***' is used with a plural verb when the noun group after the verb is plural. *There were many reasons for taking this decision.*

There +be is used for something mentioned for the first time or to say that something or someone exists.

A plural verb is used before phrases such as '*a number* (*of*)', '*a lot* (*of*)', and '*a few* (*of*)'. *There were a lot of people in the conference hall.*

A singular verb is used when more than one person or thing is mentioned and the first noun after the verb is singular or uncountable. *There was a man and two women*.

'***There***' can be used with a modal, followed by '*be*' or '*have been*'. *There should be a change in purchasing.*

'***There***' can also be used with '*appear*' or '*seem*', followed by '*to be*' or '*to have been*'. *There seems to have been some mistakes.*

In spoken and informal written English, short forms of '*be*' or a modal are normally used after '*there*'. *There's been quite a lot of research into it.*

	Singular	**Plural**
Affirmative sentence	*There is a similar light fixture on the market.*	*There are similar light fixtures on the market.*
Question	*Is there any similar light fixture on the market?*	*Are there any similar light fixtures on the market?*
Negative sentence	*There is no similar light fixture on the market.* *There is not a similar light fixture on the market.*	*There are no similar light fixtures on the market.* *There are not any similar light fixtures on the market.*

Personal pronoun + be/other verb is used to give more details about something or someone already mentioned. ***There's*** *a man in the office waiting for you.* ***He*** *wants to talk to you about the position advertised last week.*
It+be is used for identification. *There's a woman on the phone. It's our technical analyst.*
It+bewith **to-infinitive** or **that-clause** is used to begin a sentence. *It's a shame that you didn't inform us that the experiment had failed.***It** is also used for weather, distance, temperature, time expressions and in the following expressions: *It seems that, It appears that, It looks like, It is said that, It doesn't matter* etc. *It* ***seems*** *that there's a mistake in their calculations.* BUT we also say: ***There seems to be*** *a mistake in their calculations.*

<u>Demonstrative Pronouns (*this - that/these - those*)</u>
'***This***' and '***these***' refer to things near you, '***that***' and '***those***' refer to things farther away. We use ***this/that*** for singular and ***these/those*** for plural.

'***One***' or '***ones***' can be used instead ofa noun that has been mentioned or is known.

This/Theseare used

- for people or things near us. *This letter is very important.*
- for present and future situations. *They are going to take a decision this week.*
- when the speaker is in or near the place he/she is referring to. *This building is used as a warehouse.*
- to introduce people or when we introduce ourselves on the phone. *This is Mark Brown speaking.*

That/Thoseare used

- for people or things not near us. *That man over there is our new team leader.*
- for past situations. *That week was the most challenging for us.*
- to refer back to something mentioned before.*'We are developing a new project.' – 'That's great.'*
- when speaking on the phone to ask who the other person is. *Hello? Who is that*?

Articles

An article is a word that modifies or describes the noun. It is used before the noun to show whether it refers to something specific or not. Articles can also be described as a type of adjectives as they also tell us something about the nouns, like adjectives. There are two types of articles in the English language: definite and indefinite.

Definite Article

The definite article is a determiner (***the*** in English) that introduces a noun phrase and implies that the thing mentioned has already been mentioned, or is common knowledge, or is about to be defined (*the document on the table*; *the decision of government; the best product of the company*).

'***The***' can be used in front of any noun, whether it is a singular countable noun, an uncountable noun, or a plural countable noun.

Indefinite Article

The indefinite article is a determiner (***a*** and ***an***) that introduces a noun phrase and implies that the thing referred to is non-specific. It is used before singular countable nouns and cannot be used before uncountable nouns.

We use ***a*** before consonant sounds and ***an*** before vowel sounds (*a computer, an installation*).

a/an is used

• with singular countable nouns when we talk about them in general	*A power plant is a complex of structures, machinery, and associated equipment for generating electric energy from another source of energy.*
• when we refer to something for the first time (with the second reference, we use ***the***)	*They purchased **a** new installation. **The** installation is more efficient in comparison with the previous one.*
• after to *be* and *have got* when we are describing someone or something, including someone's job	*He is **a** Chief Electrical Engineer. He has **an** assistant working under him.*
• to show price in relation to weight, distance in relation to speed, frequency	*four pounds a kilo, 100km an hour, twice a month*
• before Mr/Mrs/Miss/Ms when we refer to an unknown person	*A Mr Flyng called you this morning.* (a person that we don't know)

• with some numbers to mean '***one***'	*a hundred, a thousand*
• with nouns that refer to whole numbers, fractions, money, weights, or measures	*a quarter, a half, a pound, a dollar, a kilo*
• in exclamations	*What alovely day!*

a/an is not used

• with uncountable nouns or plural countable nouns; *some* is used instead of *a/an*	*You need some experience to cope with this job.*
• before an adjective if it is not followed by a noun	*This new technological process is expensive. This is an expensive technological process.*

Unit 3

Present Continuous

We use the Present Continuous (**to be + verb –ing**)

- for actions taking place at or around the moment of speaking. *I'm **studying** for my exams these days.*
- for temporary situations. *He **is staying** at an economy hotel at the moment.*
- for fixed arrangements in the near future. *We **are visiting** our friend tomorrow.*
- for currently changing and developing situations. *The company **is entering** into negotiations more and more intensively this month.*
- with adverbs such as ***always*** to express anger or irritation at a repeated action. *My neighbours **are** always **moving** furniture at night.*

The time expressions we use with the present continuous are as follows: ***now***, ***at the moment***, ***at present***, ***these days***, ***nowadays***, ***still***, ***today***, ***tonight***, etc

State Verbs

State verbs are verbs which describe a state rather than an action, and so do not usually have a continuous tense. The **Present Continuous** is used with the following **time expression:**

- verbs of the senses (*see, hear, smell, taste, feel, look, sound, seem, appear,* etc). *She **looks** nervous today.*
- verbs of perception (*know, believe, understand, realise, remember, forget,* etc). *I clearly **remember** my feelings.*

- verbs which express feelings and emotions (*like, love, hate, enjoy, prefer, detest, desire, want,* etc). *Sandra **enjoys** her work in the city.*
- some other verbs (*be, contain, include, belong, fit, need, matter, cost, own, want, owe, weigh, wish, have, keep* etc). *I think it **matters** much what you study.*

Some of these verbs can be used in continuous tenses, but with a difference in meaning.

Present Simple	**Present Continuous**
THINK *We **think** everyone will believe us.* (=believe)	*I'**mthinking** what else I can buy.* (= am considering)
HAVE *I **have** a lovely dog.* (= own, possess)	*I hope you **are having** a great time.* (= are experiencing) *She **is having** a shower.* (= is taking) *We **are having** our lunch now.* (= are eating)
SEE *He can **see** those people from here.* (= they are visible) *You **see**, I'm really busy right now.* (= understand)	*I'**m seeing** the doctor about my treatmentat ten o'clock.* (= am meeting)
TASTE *The food **tastes** better than it looks.* (= has the flavour of)	*Joy **istasting** the beef-stake to check if it is cooked well.* (= is testing)
SMELL *The biscuits **smell** delicious.* (= has the aroma)	*She **is smelling** the flowers.* (= is sniffing)
APPEAR *All the files **appear** to be deleted.* (= seem to)	*Bred Pitt **is appearing** in this film.* (= is performing)
FIT *This bisiness suit **fits** him perfectly.* (= is the right size)	*He **is fitting** an anti-theft device to his car.* (= is installing)

Note:

- The verb ***enjoy***can be used in continuous tenses to express a specific preference. *She **enjoys** every minute of pursuing her hobby.* (general preference) BUT*She **is enjoying** knitting the sweater for her son.* (specific preference)

- The verbs ***look*** (when we refer to somebody's appearance), ***feel*** (experience a particular emotion), ***hurt*** and ***ache*** can be used in simple or continuous tenses with no difference in meaning. *My leg **huts** like hell. = My leg **ishurting** like hell.*

The Use of the Definite Article

***the* is used**	***the* is not used**
with nouns denoting something specific, when the noun is mentioned for a second time or is already known *They are talking about the contract signed two weeks ago.* *He is working for a new company now. The company is one of the largest and most successful in Britain.*	with uncountable and plural countable nouns when talking about something in general *Hydropower plants range in size from small systems for a home or village to large projects producing electricity for utilities.*
with nouns which are unique *the sun, the world, the equator, the North/South Pole, the south/west/ north/ east*	with proper nouns. *Thomas Edison had business interests in many electricity-related companies.*
with the names of cinemas *the Odeon*, hotels *the Sheraton*, theatres *the Globe*, museums *the British Museum*, galleries *the Tate Gallery*, newspapers/magazines *The Daily Mirror*, ships *the Bismarck*, organisations *the EU*	with the names of sports, games, activities, days, months, celebrations, colours, drinks, meals and languages (when they are not followed by the word 'language') *They often play chess. We speak English at our meetings.* BUT: *The English language is the language of international communication.* with the names of countries *France*, BUT: *the Netherlands, the Lebanon, the Sudan, the Vatican City*,
with the names of rivers *the Thames*, seas *the Mediterranean Sea*, oceans *the Atlantic*, canals *the Suez*, groups of islands *the Canary Islands*, mountain ranges *the Alps*, deserts *the Sahara Desert*	cities *Paris*, streets *Oxford Street*, BUT: *the High Street*, *the Strand*, *the Mall*, *the London road*, *the A19, the M6 motorway*), squares *Trafalgar Square*, bridges *Tower Bridge* BUT: *the Bridge of Sighs, the Humber*

with the names of countries when they include words such as state, Kingdom, republic, etc. *the United Kingdom*
with the names or nouns with '*of*' *the Leaning Tower of Pisa, the north of England*
with the names of musical instruments and dances *the piano, the tango*
with the names of families *the Windsors*,
with some collective nouns referring to a whole group of people, including names of nationalities ending in *-sh, -ch* or *-esethe Scottish, the French, the Japanese*
(other plural nationalities are used with or without '*the'the Americans*,
political parties *the Conservatives* or groups *the police, the government, the public, the army, the management, the electorate*
with adjectives to refer to a group of people *the poor, the rich, the elderly*

with titles *the King, the President*
BUT: '*the*' is omitted before titles with proper names *Queen Victoria*
with adjectives/adverbs in the superlative form *Fluorescent lamps are so far the most popular type of lamps used in offices and many warehouses.*

with the words *only, last, first* (used as adjectives) *Michael Faraday created the first electric generator using a coil of wire and a permanent magnet.*
with inventions *the internal combustion engine*
with the words *morning, afternoon, evening* and *nightWe check our equipment in the morning*.
BUT: *at night, at noon, at midnight, by day/night, at 4 o'clock*, etc.

Bridge,
parks *Hyde Park*,
railway stations *Victoria Station*,
mountains *Ben Nevis*,
individual islands *Sicily*,
lakes *Loch Ness*,
continents *Africa*

with possessive adjectives or the possessive case *These are my responsibilities.*

with two-word names when the first word is the name of a person or place *Gatwick Airport*
BUT: *the White House* '*White*' is not the name of a person or place

with names of pubs, restaurants, shops, banks and hotels named after the people who started them and end in *-s* or *– 's*. *Lloyds Bank, Harrods, Dave's Pub*
BUT: the *Red Lion* (pub) because '*Red*' is not the name of a person or place
with the words *bed, church, college, court, hospital, prison, school, university* when we refer to the purpose for which they exist. *The injured person is in hospital*.
BUT:*They went to the hospital to talk to the injured person.*
with the words *home, Father/Mother* when we talk about our own home and parents *They are at home*.

with the word work (place of work). *He is at work at the moment*.
with *by* + means of transport: by bus/car/train/ plane *I travel to work by bus.*
BUT: *I left on the 9 o'clock bus this morning.*

with historical periods/events *the Middle Ages, the Second World War Crimean War*
BUT: *World War II*

with the words *station, cinema, theatre, library, shop, coast, sea(side), beach, country(side), city, jungle, world, ground, weather*
Globalization has had significant impacts on all economies of the world.

with the names of illnesses *He's got malaria*.
BUT: *flu/the flu, measles/the measles, mumps/the mumps*

Unit 4

Past Simple

We use the Past Simple

- for an action that occurred at a definite time (stated or implied) in the past. *I completely **agreed** with you yesterday.*
- for actions that happened immediately one after the other in the past.*First Martin **switched off** the light, then he **left** the office.*
- for habits or states which are now finished. *We **played** tricks on each other when we were children.*

The **Past Simple** is used with the following **time expression**: ***yesterday, then, when, How longago** ...?, **last night/ week/month, year/Friday/October*** etc., ***three days/weeks*** etc.***ago**, **in 2009***, etc.

NOTE: ***used to*** can also be used instead of the past simple for habits/repeated actions in the past.*We used to sign contracts with this supplier, but now we have found another more reliable company.*

be used to + noun/ pronoun/ -ing form = be accustomed to, be in the habit of
We are used to working extra time. She is used to hot climate. She is used to it.

get used to + noun/ pronoun /-ing form = becomeaccustomed to
I am getting used to working in a team.

Numerals

Cardinal Numerals

Cardinal numerals from 1 through 1,000,000

1	one	**11**	eleven	**21**	twenty-one	**31**	thirty-one
2	two	**12**	twelve	**22**	twenty-two	**40**	forty
3	three	**13**	thirteen	**23**	twenty-three	**50**	fifty
4	four	**14**	fourteen	**24**	twenty-four	**60**	sixty
5	five	**15**	fifteen	**25**	twenty-five	**70**	seventy
6	six	**16**	sixteen	**26**	twenty-six	**80**	eighty
7	seven	**17**	seventeen	**27**	twenty-seven	**90**	ninety
8	eight	**18**	eighteen	**28**	twenty-eight	**100**	a/one hundred
9	nine	**19**	nineteen	**29**	twenty-nine	**1,000**	a/one thousand
10	ten	**20**	twenty	**30**	thirty	**1,000,000**	a/one million

Hundreds and tens are usually separated by '*and*'. In American English '*and*' is not necessary.
110 - one hundred *and* ten
1,250 - one thousand, two hundred *and* fifty
2,001 - two thousand *and* one

100 - *a* hundred / *one* hundred
7,100 - seven thousand*one* hundred

1,000 - *a* thousand /*one* thousand
301,000 - three hundred and *one* thousand

Use commas as a separator: 57,458,302

In English 1,000,000,000 is a *billion*. For some nations 'a billion' has 12 zeros.
1,000,000,000,000 in English is a *trillion*.

Numerals are usually written in singular: *four hundred Euros, two hundred people*
The plural is only used with *dozen, hundred, thousand, million, billion,* if they are not modified by another number or expression (e.g. *a few / several*): *hundreds of Euros, hundreds of people*

Ordinal Numerals

Ordinal Numerals from 1 through 1,000,000

1	st	first	**11**	th	eleventh	**21**	st	twenty-first	**31**	st	thirty-first
2	nd	second	**12**	th	twelfth	**22**	nd	twenty-second	**40**	th	fortieth
3	rd	third	**13**	th	thirteenth	**23**	rd	twenty-third	**50**	th	fiftieth
4	th	fourth	**14**	th	fourteenth	**24**	th	twenty-fourth	**60**	th	sixtieth
5	th	fifth	**15**	th	fifteenth	**25**	th	twenty-fifth	**70**	th	seventieth
6	th	sixth	**16**	th	sixteenth	**26**	th	twenty-sixth	**80**	th	eightieth
7	th	seventh	**17**	th	seventeenth	**27**	th	twenty-seventh	**90**	th	ninetieth
8	th	eighth	**18**	th	eighteenth	**28**	th	twenty-eighth	**100**	th	one hundredth
9	th	ninth	**19**	th	nineteenth	**29**	th	twenty-ninth	**1,000**	th	one thousandth
10	th	tenth	**20**	th	twentieth	**30**	th	thirtieth	**1,000,000**	th	one millionth

The cardinal numerals are formed by adding *–th* to theordinal numerals*four – fourth*. Exceptions: *one – first, two – second, three – third, five – fifth, eight – eighth, nine – ninth, twelve – twelfth*

In compound ordinal numerals only the last figure is written as an ordinal number: 221st – *two hundred and twenty-first*

When expressed as figures, the last two letters of the written word are added to the ordinal number: *first– 1st, hundred and second – 102nd*

In names for kings and queens, ordinal numbers are written in Roman numbers. In spoken English, the definite article is used before the ordinal number: *HenryVIII - Henrythe Eighth*

In phone numbers each figure is said separately and the pause after groups of 3 or 4 figures is made. The figure ‘0’ is called *oh*: *356 4205 - three five six, four two oh five*

If two successive figures are the same, in British English, the word *double* is usually used (in American English the figure is repeated twice)
506 4778 (BE): *five o six, four double seven eight*
506 4778 (AE): *five zero six, four seven seven eight*

From 2000 onwards, years are pronounced like ordinary cardinal numerals: 2000 -*two thousand*, 2008 -*two thousand and eight*

Earlier years are pronounced differently: the first two figures are a number and the last two figures are a number. They can be joined by *hundred and*, which is only necessary, however, if the last two figures are 00 through 09: 1997 -*nineteen (hundred and) ninety-seven*, 1805 -*eighteen hundred and five/ eighteen oh five*

To distinguish between the dates before and after the birth of Christ, BC und AD are used: BC '*Before Christ*', AD = '*Anno Domini*'

'0' is said as:

nought	in mathematical expressions and decimals 0.5 '*nought pointfive (or 'point five')* 0.05 '*pointnoughtfive*'
zero	in scientific expressions, especially temperatures -15°C *minusfifteen degreesor twenty degrees below zero* also used to mean 'the lowest point' *It reduced resistance to zero.*
'**o**' (the letter)	in telephone numbers 0273 190 0042 = '*o two seven three one nine o double o four two*'
nil/**nothing**	to express the score in games such as football 3- 0 '*three nil' or 'three nothing*'

Unit 5

Past Continuous

We use the past continuous

- for an action which was in progress when another action interrupted it. We use the past continuous for the action progress (the longer action), and the past simple for the action which interrupted it (shorter action). *She **was walking** home when it **rained**.*

- for two or more simultaneous actions in the past.*Jason **was teaching** Jane to use the phone in his office while Steve **was speaking** to a client.*
- for an action which was in progress at a stated time in the past. We don't mention when the action started or finished. *At 8 o'clock yesterday evening I **was doing** some extra work in the department.*
- to describe the atmosphere, setting, etc. and to give background information in a story. *It **was snowing** and the wind **was blowing** as I **was walking** towards*
- *the station.*

Note: When there are two past continuous forms in a sentence with the same subject, we can avoid repetition by just using the present participle (-ing form) and leaving out the subject as well as the verb ***to be***.

*Jeffrey **was thinking** about the future; he **was motorcycling** home. = Jeffrey **was thinking** about the future while motorcycling home.*

The **Past Continuous** is used with the following **time expression**: ***while***, ***as***, ***all morning/evening/day/week***, etc

Note: when/while/as+ past continuous (longer action)

when+ past simple (shorter action)

***When/While/As** he was replacing the lighting fixtures, the telephone rang. He was replacing the lighting fixtures **when** the telephone rang.*

Unit 6

Present Perfect

We use the Present Perfect (**have + past participle**) for

- an action that happened at an unstated time in the past. The emphasis is on the action, the time when it occurred, is unimportant or unknown.*She **has seen** him greeting the client. I **have mastered** German at the language courses.*
- an action which started in the past and continues up to the present, especially with state verbs such as **be**, **have**, **like**, **know**, etc. *Many people **have known** him as a local businessman for long.*
- a recently completed action. *Stephen **has repaired** the photocopier.*
- personal experiences or changes. *I **have lost** six kilos.*

- an action which has happened within a specific time period which is over at the moment of speaking. We use words and expressions such as **today**, **thismorning/evening/week/month**, etc. *They **have interviewed** three applicants today.* (= the time period – today – is not over yet. They may interview more.)

The **Present Perfect** is used with the following **time expression**: ***for***, ***since***, ***already***, ***always***, ***just***, ***ever***, ***never***, ***so far***, ***today***, ***this week/month***etc., ***how long***, ***recently***, ***still(in negations)***, ***lately***, ***yet***, ***by now***, etc.

NOTE:

*He **has gone** out to lunch.* (He is on his way there or he is there now.He hasn't come back yet.)

*We **have been** to Italy.* (We have been to Italy but we aren't there now. We have come back.)

*I **have been** in Austria for a month.* (I'm in Austria now.)

Unit 7

Present Perfect Continuous

We use the Present Perfect Continuous (**have + been + verb –ing**)

- to put emphasis on the duration of an action which started in the past and continuous up to the present. *They **have been keeping** calm during the whole meeting.*
- for an action which started in the past and lasted for some time. It may still be continuing or have already finished with the result visible in the present. *Karen is sweating because she **has been doing** physical exercises for three hours.*
- to express anger, irritation or annoyance. *Who **has been using** my computer?*
- for repeated actions in the past continuing to the present.*We are very likely to reach an agreement as we **have been discussing** the issues very carefully.*

The **Present Perfect Continuous** is used with the following **time expression**: ***for***, ***since***, ***how long***, ***all day/morning/month*** etc., ***lately***, ***recently***

NOTE: with the verbs***live***, ***work***, ***teach*** and ***feel*** we can use the present perfect simple or the present perfect continuous with no difference in meaning. *I* ***have felt/have been feeling*** *homesick for the time I was abroad.*

Quantifiers*some/any/no, every/each*

Someand ***any***are quantifiers. ***Some***and ***any*** are used to state the quantity, amount of something. When using ***some***or***any***, the exact number is not stated.

Some and ***any*** can be used when

- the exact number is not known
- the exact number is not important or relevant.

Some and ***any*** are used with countable and uncountable nouns. ***Some*** *new inventions were presented. You need to collect* ***some*** *information about this phenomenon*.

Some and its compounds (***somebody***, ***something***, etc.) are normally used in positive sentences. They are also used in questions when we want to make an offer, a request or when we expect a positive answer. ***Someone*** *phoned yesterday and informed us about this event*. (positive) *Would you like* ***some*** *time to think it over*? (offer) *Could I have* ***some*** *tea, please*? (request) *Is there* ***someone*** *who can prepare this report*? (I expect there will be.) BUT: *Is there* ***anyone*** *who can prepare this report*? (I am asking in general.)

Anyand its compounds (***anybody***, ***anything***, etc.) are normally used in questions. *Is there any mistake*? They are also used in positive sentences meaning 'It doesn't matter how/what/which/when/ who/where'. *You can use* ***any*** *source of information*. ***Any***and its compounds can be used after *if* in a positive sentence. *If* ***anyone*** *helps us, we'll be really obliged*.

No/not any are used before countable and uncountable nouns.***No/not any*** and their compounds (*no one*/*notanyone, nothing/ not anything*, etc.) are used in negations. *There is* ***nothing*** *we can do under these circumstances. There isn't* ***anything*** *we can do under these circumstances.* ***Any***and its compounds are used with negative words (*hardly, never, without, seldom, rarely*, etc.). *We* ***hardly*** *ever participate in discussions these days*.

Every and ***each*** are used with singular countable nouns. ***Each*** is normally used when we talk about two people or things separately, one at a time. ***Every*** is normally used when we talk about three or more people or things together, in a group to mean '*all*', '*everybody/everything*'. *There were two papers and the mistakes were in each of them. Every participant was sent an invitation.*
Everyone and ***each (one)*** can be followed by ***of***. *I've looked through several projects and I like every one of them.*

We use ***every*** to show how often something happens. *We have to send a report every three months*.

We use ***every***but not ***each*** with words and expressions such as *almost*, *nearly*, *practically* and *without exception*. *She has discussed it with every manager at the meeting, without exception.*

	Adjectives	**Pronouns**		**Adverbs**
		people	**things**	**places**
Positive	*some* *any*	*someone/* *somebody* *anyone/anybody*	*something* *anything*	*somewhere* *anywhere*
Interrogative	*any*	*anyone/anybody*	*anything*	*anywhere*
Negative	*no/not any*	*no one/* *not anyone* *nobody/* *not anybody*	*nothing* *not anything*	*nowhere* *not anywhere*
Positive/ Interrogative/ Negative	*every*	*everybody (all people)* *everyone*	*everything (all things)*	*everywhere (in all places)*

Unit 8

Past Perfect

We use the Past Perfect (**had + past participle**)

- for an action which happened before another past action or before a stated time in the past. *The latest news* ***had come in*** *by the end of the day.*

- for an action which finished in the past, and whose result was visible at a later point in the past. *I **had saved** some money but still couldn't afford myself to buy a new car.*

The **Past Perfect** is used with the following **time expressions**: ***before, after, already, just, for, since, till/until, when, by the time, never, etc.***

Past Perfect Continuous

We use the Past Perfect Continuous:

- to put emphasis on the duration of an action which started and finished in the past, before another action or stated time in the past, usually with **for** or **since**. *He **had been surfing** the Internet for quite a long time **before** he found the right information.*
- for an action which lasted for some time in the past and whose result was visible in the past. *Dan's presentation **was** great as he **had been researching** the point for long.*

The **Past Perfect Continuous** is used with the following **time expressions**: ***for, since, how long, before, until, etc.***

Time expressions to talk about the past:

ago (= back in time from now) is used with the past simple. *They announced a new vacancy a week **ago**.*

since (= from a starting point in the past) is used with the present perfect (simple and continuous). *He hasn't had any good business idea **since** they stopped supporting him.*

for (= over a period of time) is used with the present perfect (simple and continuous). *He has been working with experts **for** two hours.*

already is used in statements and questions (sometimes in order to show surprise). *We have **already** had a direct contact with the company. Have you come into contact with that company **already**?*

yet is used with the present perfect in questions and negations. *Has she phoned her counterpart **yet**? She hasn't phoned her counterpart **yet.***

NOTE: The Past Perfect is the past equivalent of the Present Perfect.
*He **is** lucky. He **has got** his money back.*
*He **was** lucky. He **had got** his money back.*

The Past Perfect Continuous is the past equivalent of the Present Perfect Continuous.
*Sue **is** tired. She **has been helping** around the house for half a day.*
*Sue **was** tired. She **had been helping** around the house for half a day.*

Quantifiers *a lot of /much /many, a few/few – a little/little*

	Countables	**Uncountables**	
Positive	*a lot (of)/lots of/ many* (formal)	*a lot (of)/lots of/ much* (formal)	*They demonstrated **a lot of** lighting fixtures from casual chandeliers to industrial light fixtures.* *They have collected **a lot of** information about the history of lighting.*
Interrogative	*many*	*much*	*Are there **many** chances to increase the system reliability?* *Do we have **much** time to change the parameters?*
Negative	*many*	*much*	*There aren't **many** visitors in the office today.* *There was **much** traffic on the motorway.*
	a few (=*some*)/ (*very*) *few* (=*not many, not enough*)	*a little* (=*some*)/ (*very*) *little* (=*not much, not enough*)	*Very **few** rivers aren't polluted.* *Scientists have **little** hope of finding a solution to this problem.*

A lot (of)/Lotsof are used with countable or uncountable nouns and are normally used in positive sentences. *There were **a lot of** applicants for the position*. *They have got a lot of work to finish*. ***A lot of*** can be used in questions or negative sentences in informal English. *Was there **a lot of** opposition to your ideas*?

Many is used with countables and ***much*** with uncountables. They are normally used in questions or negative sentences. *How **many** engineers are involved in this project?We haven't **much** money to finish the construction.**Many*** or ***much*** are often usedin positive sentences after ***too***, ***so***, ***how***or in formal English. *He has made so **many** mistakes. **Much** human labour is necessary to use to maintain this system.*

A few is used with countables and ***a little*** with uncountables. They both have a positive meaning. ***A few*** means '*some*', '*a small number'*. ***A little*** means '*some*', '*a small amount of*'. *We need just* ***a few*** *more days to check out the calculations.* ***A little*** *hope is always important.*

Few/Little both have a negative meaning. ***Few*** means '*not many*', '*almost none*'. ***Little*** means '*not much*', '*almost none*'. ***Few*** and ***little*** are rather formal English. ***Very few/very little*** are more usual in everyday speech. It is also common to use: *only a little, only a few*.

We use *most/all/some/any/many/a few/several/both/two/one/much/* (*a*) *little + of* when a noun follows, preceded by possessives or the words: *this, that, these, those, the* or *a*.*Most of the participants were English.* BUT: *Most business travelers prefer to book a hotel in advance.*

Unit 9

Future Simple

Predictions	*It looks as if John* ***will get*** *a new position.*
Future facts	*The presentation of a new product* ***will be*** *in June.*
Decisions made at the moment of speaking	*I know! I'****ll ask*** *Jimmy for advice.*
Offers	*I'****ll help*** *you with conducting the negotiations.*
	BUT: ***Shall*** *I(we)* ***help*** *you with conducting the negotiations?*
Promises	*I promise you I* ***won't*** *tell anybody about it.*
Requests	***Will/would/ could/can*** *you* ***give*** *a presentation yourself?*
Refusals (*won't*)	*No, I* ***won't /couldn't/can't give*** *a presentation myself.*

be going to

Predictions based on present evidence	*Look at that wall. It looks as if it'****s going to*** *fall down.*
Intentions	*I'****m going to*** *get my degree, then get a well-paid job.*

Present Continuous

Arrangements	*I'****m meeting*** *Ted on Monday to discuss our business trip.*
Intentions	*I'****m asking*** *for raising my salary tomorrow.*

Present Simple

Fixed future events (*e.g. timetables, and schedules*)	*The meeting **starts** at 3 p.m. sharp.*

Future Perfect

Completed situations before a certain time	*It looks as if I **will have lost** my job by the end of the week.*
Continuing situations up to a certain time	*This time next month I'**ll have worked** at the company for exactly 20 years.*

Future Perfect Continuous

Continuing situations up to a certain time (*emphasizes duration*)	*This time next month, I'**ll have been working** at the company for exactly 20 years.*

Future Continuous

Situations in progress at a certain time in the future	*This time next week I'**ll be flying** to China on business.*
Situations which will happen in the future in the normal course of events	*The Managing Director **will be arriving** on Monday.*
Habits or repeated actions at a point in the future	*I think that, in the future, more and more people **will be commuting** to work by electromobiles.*

Time Clauses

After many time words and phrases, such ***as when, while, once, as soon as***, ***until***, etc., we do**not** use ***will*** or ***be going to***.

Present Simple	*I'll give you a pay rise when you **start** working harder!*
Present Progressive	*I'll give you a pay rise once you'**re bringing** in three new customers a week.*
Present Perfect Simple	*I'll give you a pay rise as soon as you'**ve proved** you're a hard worker.*
Present Perfect Continuous	*I won't give you a pay rise until you'**ve been working** here for three years.*

Other Ways to Express the Future

be (just) about to	for the very near future	*I'**m just about to ask** for my pay rise.*
be (just) on the point/ verge of	for the very near future	*I'**m just on the point/verge of asking** for my pay rise.*

be due to	for formal arrangements	*I'**m due to meet** my boss at ten o'clock.*
be to do	for obligations	*You'**re to get** those reports written before Friday!*
	for formal announcements	*The factory **is to open** in May.*
other modals	to express certainty, possibility, etc.	*I **might** ask for a pay rise tomorrow.*

Future in the Past

When we look back at what was the future once, we usually make the future verb forms past. ***Will*** becomes ***would***, ***is going to*** becomes***was going to***, etc.

will	⇨	would	Then: *I think the factory **will open** in May.*
			Now: *I thought the factory **would open** in May.*
present simple	⇨	past simple	Then: *I'm in a rush because the train **leaves** at 4.*
			Now: *I was in a rush because the train **left** at 4.*

Quantifiers *both/neither - all/none - either*

Both refers to two people, things or groups. It has a positive meaning and is followed by a plural verb. *Both men work for the same company*.

All refers to more than two people, things or groups. It has a positive meaning and is followed by a plural verb. *All the changes were successful.*

Both/All can go: a) after the verb to be, b) after the auxiliary verb, but before the main verb. e.g. *They are both/all present.They have both/all denied a charge* .

All + day/morning/week/ year = the whole + day/ morning/week/year e.g. He's been working all morning /the whole morning.

Whole is used with singular countable nouns. We use a/the/this/my etc. + whole + noun. *They made a mistake and decided to change the whole plan.*

Neither refers to two people, things or groups and has a negative meaning.

Neither of + plural noun phrase can be followed by either a singular or plural verb in the affirmative. *Neither of them is/are in the office at the moment.*BUT: *Neither installation is efficient enough.*

None of refers to more than two people, things or groups and has a negative meaning. It is used with nouns or object pronouns and is followed by either a singular or plural verb. *None of the engineers knew about the accident.*

Either refers to two people, things or groups and is followed by a singular countable noun. *There are two schemes. Either scheme is fine.*

Either of + plural noun phrase can be followed by either a singular or plural verb. *Either of these contracts is/are important for our company.*

We can use **not ... either (of)** instead **of neither (of)**. **Either** can also be used at the end of a negative sentence. *I read two reports, but I didn't like either of them.*

Neither ... nor/Either ... or take either a singular or plural verb, depending on the subject which follows **nor**or **or**. *Either Mary or Ann is going to send the letter of complaint.*

Both ... and is followed by a plural verb. *Both Tim and Sam are working on this project.*

Unit 10

The Passive

The Passive is formed with the verb 'to be' in the appropriate tense and the past participle of the main verb. Only transitive verbs (verbs which take an object) can be used in the passive. The Passive is used when

- the person who carries out the action is unknown, unimportant or obvious from the context. *The production line has been stopped*.
- when the action itself is more important than the person who carries it out, as in news headlines, newspaper articles, formal notices, instructions, , advertisements processes, etc.*The meeting with the developers will be held at 2 pm.*
- when we refer to an unpleasant event and we donot want to say who or what is to blame.*Ten samples have been damaged.*

Changing from the Active to the Passive

- the object of the active sentence becomes the subject in the passive sentence
- the active verb remains in the same tense, but changes into a passive form
- the subject of the active sentence becomes the agent, and is either introduced with the preposition by or omitted.

By + agent is used to say who or what carries out the action. **With + instrument/material/ ingredient** is used to say what the agent used. *The changes were made by our engineer. The line was drawn with pencil.*

The agent can be omitted in the passive sentence when the subject of the active sentence is one of the following words: *people, one, someone/somebody, they, he,* etc. The agent is not omitted when it is a specific or important person or when it is essential to the meaning of the sentence.

Object pronouns (*me, you, him,* etc.) become subject pronouns (*I, you, he,* etc.) in the passive. *They explained **him** all the details. **He** was explained all the details.*

With verbs which take two objects such as *bring, tell, send, show, teach, promise, buy, throw, write, award, hand, sell, owe, grant, allow, feed, pass, post, read, take, offer, give, pay* and *lend* two different passive sentences can be made.
Active:*Laura showed him some photos*.
Passive: *He was shown some photos by Laura. Some photos were shown to him by Laura.*

Adjective

An adjective is a word that describes a noun, giving extra information about it. Adjectives have the same form in the singular and plural. Most adjectives can be used in two positions. When they are used before the noun they describe, they are called attributive. *It is some **technical** problem.* When they are used after a verb such as *be, become, grow, look,* or *seem,* they are called predicative. *They seem **interested** in our ideas*. There are some adjectives that can only be used in one position or the other.
There are opinion adjectives and fact adjectives. Opinion adjectives show what a person thinks of somebody or something. Fact adjectives give us factual information about age, size, colour, origin, material, etc.
When there are two or more adjectives in a sentence, they usually go in the following order:

Opinion/ Quality Adjectives	**Fact Adjectives**							**Noun**
	size	**age**	**shape**	**colour**	**origin**	**material**	**used for/ be about**	
fantastic	*small*	*new*	*round*	*red*	*Swiss*	*plastic*	*alarm*	*clock*

Unit 11

Personal/Impersonal Passive Constructions

The verbs *think, believe, say, report, know, expect, consider, understand*, etc. are used in the following passive patterns in personal and impersonal constructions.
They expect him to take a decision soon. - It is expected (that) he will take a decision soon. (impersonal) *He is expected to take a decision soon.* (personal)

Comparative and Superlative Degrees of Adjectives

Most adjectives have three different forms, the absolute (also known as the positive), the comparative, and the superlative. The comparative form is used for comparing two people or things, while the superlative is used for comparing one person or thing with every other member of their group. We often use ***than*** after a comparative. (*This system is more reliable **than** the previous one*.) We often use ***of*** or ***in*** after superlative. We use ***in*** with places. (*He is the most creative person **in** our team*.)

	Positive	**Comparative (than)**	**Superlative (of/in)**
Very short words (one syllable)			
+ ***er***	small	small**er**	**the** small**est**
+ *est*	old	old**er**	**the** old**est**
	big	big**ger**	**the** big**gest**
Short words (two syllables) Ending in –***y, -ow, -er, -le***			
+ ***er***	heav**y**	heav**ier**	**the** heav**iest**
+ *est*	clev**er**	clever**er**	**the** clever**est**
	narr**ow**	narrow**er**	**the** narrow**est**
	simple	simp**ler**	**the** simp**lest**
Short words (two syllables) NOT ending in –***y, -ow, -er, -le***			
+ *more*	tired	**more** tired	**the most** tired
+ *most*	awful	**more** awful	**the most** awful
	famous	**more** famous	**the most** famous
	simple	**more** simple	**the most** simple
Long words (three or more syllables)			
+ *more*	beautiful	**more** beautiful	**the most** beautiful
+ *most*	horrible	**more** horrible	**the most** horrible
	expensive	**more** expensive	**the most** expensive

Adjectives or their comparative or superlative forms are used with the following words:

very + adjective	*This is a **very expensive** gift.*
much/a lot /far/a little/a bit/slightly + comparative	*It's **much hotter** today than yesterday.*
by far + superlative	*He's **by far the best** student in the class.*

Irregular Forms

Positive	**Comparative**	**Superlative**
good	better	(the) best
bad	worse	(the) worst
far	further/farther	(the) furthest/farthest

Unit 12

Comparison Structures

as + adjective **+as** **not as…as, not so …as**	*Paul is **as** old **as** Richard.* *Alison is **not as/so** clever as Cynthia.*
comparative **+ and +** comparative	*As time went by, he got **more and more impatient.*** *He tried **harder and harder** until he opened the door.*
the+comparative **…,** **the+**comparative	***The longer** he talked, **the more confused** they became.*
the same …as	*This task is of **the same** difficulty **as** that we had yesterday.*

We use **so + adjective** *The project was so interesting that we agreed to join it.*
We use **such + noun***We do not employ such people.*
We also use **such + adjective + noun***It was such a silly mistake.*
Enough goes after adjectives and **too** before adjectives. *He isn't qualified enough. Your work is too hard.*

Unit 13

Adverbs. Formation of Adverbs

Adverb is a word that adds to the meaning of a verb, an adjective, another adverb, or a whole sentence.

Most adverbs are formed by adding *-ly* to their corresponding adjectives:

most adjectives	serious – serious**ly**
adjectives ending in-***le***	probabl**e** – probabl**y**
adjectives ending in consonant +**y**	luck**y**– luck**ily**
adjectives ending in ***-l***	awful – awfully
adjectives ending in-***ic***	economic – economic**ally** BUT: public – public**ly**
adjectives ending in-***e***	polite – polite**ly**

Order of Adverbs

Adverbs usually go after verbs but before adjectives, other adverbs and participles.

Adverbs of **manner** go before the main verb, after the auxiliary verb or at the end of the sentence. *They easily coped with the task.*

Adverbs of **degree** (*absolutely*, *completely*, *totally*, *extremely*, *very*, *quite*, *rather*, etc.) go before an adjective, an adverb or a main verb, but after auxiliary verb. *This plan is totally unacceptable.*

Adverbs of **frequency** go after auxiliary verbs and the verb *to be*, but before main verbs. *He is always changing his mind.*

Adverbs **of place and time** usually go at the end of the sentence. *We'll discuss it tomorrow.*

Some **one-syllable adverbs of time** such as *soon*, *now* and *then*, go before the main verb, but after the auxiliary verb or the verb *to be*. *They will soon send us a confirmation.*

An adverb can be put at the beginning of a sentence if it is necessary to emphasise it. *In the office, there was nobody.*

When there are two or more adverbs in the same sentence, they usually come in the following order: manner – place – time. *He checked the reports carefully in the office until10.00.*

If there is a verb of movement in the sentence, the adverbs come in the following order: place – manner – time.*They went to the Egypt subsidiary suddenly two hours ago.*

Comparisons of Adverbs

The comparative and superlative forms of adverbs are formed in the same way as those of adjectives.

Adverbs which have the same form as the adjective usually take *-er* in the comparative and *-est* in the superlative. (*hard - harder -* (*the*) *hardest*)

Unit 14

Modal Verbs *obligation/duty/necessity, absence of necessity, prohibition*

duty	
Present/Future	**Past**
*Local authorities **must** keep the streets clean.* *Any parent **must** protect his or her child.* *He really **ought to** quit smoking.* (It's the right thing to do, but people don't do it.)	*Local authorities **had to** keep the streets clean.* *Any parent **had to** protect his or her child.* *He really **ought to** quit smoking.* (It was the right thing to do, but people didn't always do it.)
prohibition	
Present/Future	**Past**
*You **can't** wear casual clothes at work.* (you aren't allowed) *You **mustn't** use your mobile phone here.* (it is forbidden) *You **may** not put on my dress.* (formal)	*You **couldn't** wear casual clothes at work.* (you weren't allowed) – –
obligation	
Present/Future	**Past**
*I **must** have a balanced, healthy diet.* (I need to; I say so) *I **have to** be on a diet.* (I am obliged to; my doctor said so.) *Employers **ought to** treat their employees equally.* (It's the right thing to do, but they don't always do it.)	*I **had to** have a balanced, healthy diet.* (I needed to; I said so) *I **had to** be on a diet.* (I was obliged to; my doctor said so.) *Employers **ought to** treat their employees equally.* (It was the right thing to do, but they didn't always do it.)
necessity	
Present/Future	**Past**
*I **must** meet a visitor in person.* (I say so) *He **has to** check the result of the experiment.* (necessity coming outside the speaker)(he needs to)	*I **had to** meet a visitor in person.* (I obliged to) *He **had to** check the result of the experiment to see if it was true.*

*He'**s got to** sell his new laptop.* (informal)(need to) *The dog **needs** training not to bark. OR* *The dog **needs** to be trained not to bark.* (it is necessary) *They **ought to** solve his problems.* (it is necessary)	*He **had to** sell his new laptop.* *The dog **needed** training not to bark. OR* *The dog **needed** to be trained not to bark.* (it was necessary)
absence of necessity	
Present/Future	**Past**
*She **doesn't have to/doesn't need to/ needn't** give a visitor a tour of the office.* (it isn't necessary – absence of necessity)	*She **didn't have to/didn't need to** give a visitor a tour of the office.* (it wasn't necessary for her to give a visitor a tour of the office and she didn't do it – absence of necessity) *He **needn't have to** ask for help.* (it wasn't necessary for him to ask for help but he did)

Unit 15

Modal Verbs *probability, ability, lack of ability, logical assumption*

probability	
Present/Future	**Past**
*I **will** make a start tomorrow.*(100% certain; prediction) *You **should** renew your licence.* (90% certain; future only; it's possible) *He **ought to** be in the office by now.* (90% certain; he will probably be in the office)	– *He **should** have arrived by now.*(He has probably arrived.) *They **ought to** have gone on business by now.* (They have probably gone on business.)
ability	
Present/Future	**Past**
*We **can** speak German.* (has the ability) *He **is able** to make people work.*	*We **could/were able to** speak German.* (repeated action – ability in the past) *We **were able to** go on a two-month tour of Europe.* (single action)
lack of ability	
Present/Future	**Past**
*I **can't** install new software on my computer.*	*I **couldn't** install new software on my computer.*

*He **isn'table** to enter information into a computer.*	*He **wasn'table** to enter information into a computer.*
logical assumption	
Present/Future	**Past**
*She **must** be in an extremely confused state of mind.* (90% certain – positive; I am sure she is in an extremely confused state of mind) *She **can't** be famous.* (negative; I'm sure she is not famous) *They **couldn't** be busy.* (negative; I don't think they are busy)	*They **must have** opened negotiations.* (positive; I'm sure they have opened negotiations) *They **can't have** reached an agreement.* (negative; I'm sure they didn't reach an agreement) *She **couldn't have** been on holiday.* (negative; I don't think she was on holiday)

Unit 16

Modal Verbs *possibility; request; permission*

possibility	
Present/Future	**Past**
*She **can** still be at work.* (90% certain) *He **could** be ill.* (50% certain; it's possible she is ill) *She **may** be chatting away about her social life.* (50% certain; it's possible that she is chatting) *They **might** need to come early.* (40% certain; perhaps they need to come early) ***It is likelythat** Tom will accept a job in another country.* (90% certain) ***Tom is likely to** have missed the train.* (90% certain)	– *They **could have** had an accident.* (luckily they didn't) *Sue **might have** tried to contact us.* (perhaps she has tried to) ***It was likely that** she had taken a taxi.* ***She was likely to** have taken a taxi.*
request	
Present/Future	**Past**
***Can** I turn down that music?* (informal; *Is it OK if …?*) ***Could** I use tour mobile phone?* (polite; *May I …?*) ***May** I have some water?* (formal) ***Might** I leave work a bit earlier today?* (very formal)	– – – –

***Will** you give me a ride home?* (very friendly) ***Would** you mind mailing the letter for me?* (polite)	– –

permission	
Present/Future	**Past**
*You **can/are allowed to** use this area for sports and games.* (giving permission; informal) *You **can't** use these resources.* (refusing permission; informal) ***Could** I visit you tomorrow?* (more polite; asking for permission) *He **may** be excused.* (formal; giving permission) ***Might** I use a dictionary in the exam?* (more formal; asking for permission)*(Could I …?)* *I'm afraid you **can't/mustn't** invite those people.* (formal; refusing permission – aren't allowed to) *Children under 12 **may not** enter without an adult.* (formal; refusing permission –written notice – aren't allowed to)	*She **wasn't allowed to/couldn't** get on a train.* *She **was allowed to** see the patient.* *(NOT: ~~could~~)* – – – – –

Unit 17

Modal Verbs *advice; offers; suggestion; criticism*

advice	
Present/Future	**Past**
*You **should** think about the consequences.* (general advice; I advice you) *You **ought to** keep to the speed limit.* (I advice you; most people believe this) *You **had better** not tell her everything.* (It's not a good idea; advice on a specific situation) ***Shall** I see a doctor?* (asking for advice)	*You **should have** thought about the consequences.* (but you didn't) *You **ought to** have driven carefully.* (but you didn't) *It **would have been better** if you hadn't listened to negative people.* (but you did) –
offers	

Present/Future	Past
CanI/we *offer you something to drink?* (informal)	–
Shall I/we *pick you up at the station?* (informal)	–
Would you like me *to do it for you?* (informal)	–
suggestion	
Present/Future	**Past**
Shall *we stop for a snack?*	–
I/We can *always order a takeaway.*	–
We ***could*** *go to the office right now.*	*We* ***could have*** *gone to the office then.*
criticism	
Present/Future	**Past**
She ***could*** *at least be in control of her feelings.*	*She* ***could*** *at least* ***have*** *been in control of her feelings.*
They ***should*** *invite us.*	*They* ***shouldhave*** *invited us.* (but they didn't)
They ***ought to*** *treat people with respect.*	*They* ***ought tohave*** *treated people with respect.* (It was the right thing to do but they didn't do it.)

Appendix

Irregular Verbs

There are about 180 irregular verbs. Some are very unusual. Here are the most useful.

First form	Second form	Third form		First form	Second form	Third form
All forms the same				***Second and third forms the same***		
cost	cost	cost		bend	bent	bent
cu	cut	cut		build	built	built
hit	hit	hit		feel	felt	felt
hurt	hurt	hurt		keep	kept	kept
let	let	let		leave	left	left
put	put	put		light	lit	lit (lighted)
set	set	set		lend	lent	lent
shut	shut	shut		mean	meant	meant
split	split	split		meet	met	met

Similar sound group				send	sent	sent
beat	beat	beaten		shoot	shot	shot
bit	bit	bitten		sleep	slept	slept
eat	ate	eaten		spend	spent	spent
fall	fell	fallen		spoil	spoilt	spoilt
forget	forgot	forgotten		get	got	got
forgive	forgave	forgiven		lose	lost	lost
give	gave	given		sat	sat	sat
hide	hid	hidden				
shake	shook	shaken		bring	brought	brought
take	took	taken		buy	bought	bought
tear	tore	torn		fight	fought	fought
wear	wore	worn		think	thought	thought
				catch	caught	caught
blow	blew	blown		teach	taught	taught
flow	flew	flown				
know	knew	known		feed	fed	fed
throw	threw	thrown		find	found	found
grow	grew	grown		have	had	had
draw	drew	drawn		hear	heard	heard
				hold	held	held
begin	began	begun		make	made	made
drink	drank	drunk		pay	paid	paid
ring	rang	rung		read	read	read
sing	sang	sung		say	said	said
shrink	shrank	shrunk		sell	sold	sold
				stand	stood	stood
freeze	froze	frozen		understand	understood	understood
speak	spoke	spoken		tell	told	told
steal	stole	stolen		stick	stuck	stuck
break	broke	broken		win	won	won
wake	woke	woken		shine	shone	shone
choose	chose	chosen		***All forms different***		
drive	drove	driven		be	was/were	been
write	wrote	written		become	became	become

ride	rode	ridden		come	came	come
				do	did	done
				go	went	gone
				run	ran	run
				see	saw	seen
				show	shown	shown
				spill	spilled	spilt

Confusing Verbs

lay	laid	laid	laying	- to put sth in a particular position
lie	lay	lain	laying	- to be or put yourself in a flat position
lie	lied	lied	lying	- to say sth that you know is not true

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